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Original Communications.

*HYGIENIC THERAPEUTICS—A LECTURE ON HYDROTHERAPY.**

By Professor Dujardin-Beaumetz, Paris, France.

GENTLEMEN:—I intend to devote to hydrotherapy four lectures. In the first I shall give the history of hydrotherapy; in the second I shall study its physiological effects and methods of application; in the third I shall examine the benefits which we are warranted to expect from it in the treatment of chronic diseases; in the fourth and last I shall take up one of the most disputed points of hydrotherapy,—I refer to the application of cold water to acute febrile diseases.

* From advance sheets. An abstract of two lectures delivered in Cochin Hospital. Translated by E. P. Hurd, M.D.

I.

HISTORY OF HYDROTHERAPY.

Like kinesitherapy and massotherapy, hydrotherapy dates from the earliest history of all nations. Primitive tribes have always practised some mode of water-cure in their attempt to deal with the problem of disease. We see, even to-day, savage people living like the prehistoric man in the Stone Age, and using cold water as a means of cure in sickness. Thus it is with remedial intent that the native women of the Fiji Islands precipitate

themselves into the sea immediately after their confinement.

The popular traditionary belief that bathing in cold water removes all impurities of the body has been transmitted from age to age, and has always taken a religious shape. What is the practice of the Hindoo who regularly dips himself in the sacred waters of the Ganges or the sacred lakes which surround his temples, what are the baths of purification ordered by the law of Moses and the Talmud, and the ablutions required by the Mohammedan religion, but examples of this early traditionary belief?

In the history of the Greek nation we find also traces of these popular traditions in the earliest or mythical period of this history. Thus we read that Melanapus cured the three daughters of Prœtus, king of Argos, by dipping them in the water of Anigrus after a march of ten leagues. The temples of Hercules, where the sick sought restoration and invigoration by immersions in cold water, represented this popular notion as to the efficacy of cold water. But we must come down to the time of the priest-physicians the Asclepiadæ, and in particular to Hippocrates, the father of medicine, before we find any distinct scientific teaching as to the physiological action of water, and you will find in the treatise of the latter on "*Air, Water, and Places*," in that on the "*Usage of Liquids*," and in the chapter on "*Diet and Regimen*," precise indications as to the employment of water in therapeutics.

But it was in the Roman period that the two founders of hydrotherapy—Musa and Charmis—appeared. Musa, like all the Roman physicians, was of Greek origin; physician to Augustus, he rendered himself famous by curing his imperial patron of a disease of the liver by cold baths, of which we have the following account in Suetonius: "During the whole course of his life he (Augustus) suffered at times dangerous fits of sickness, especially after the conquest of Cantabria, when, his liver being injured by a defluxion upon it, he was reduced to such a condition that he was obliged to undergo a desperate and doubtful mode of cure; for warm applications having no effect, Antonius Musa directed those that were cold."*

Augustus recompensed his physician munificently, and, besides a considerable sum of money, he presented him with a gold ring which conferred on him the order of knighthood, and he erected statues in his honor.

The method of Musa consisted in affusions of cold water after the use of warm baths and vapor-baths. Horace, in accordance with the advice of Musa, abandoned the warm baths of Baia for the cold-water douches and affusions of Clusium. There has been a long dispute as to whether Marcellus, also treated by Musa, owed his death to cold-water treatment; but it was Charmis who was the most rigorous and relentless in the application of hydrotherapy. Charmis was born at Marseilles, but he practised at Rome, and Pliny has given us the picture of Roman senators shivering under the influence of the cold baths which Charmis had ordered them to take. If Charmis was very severe in the application of his method, he showed himself, according to Pliny, to be very greedy of money: he exacted two hundred thousand sesterces (more than eight thousand dollars) as a fee from a patient who came from a distant province in order to consult him. Charmis, as well as Musa, lived in the first century of the Christian era.

The hydrotherapic practices excogitated by Musa and carried to excess by Charmis gave rise to protestations and widely dissentient opinions, and one hundred and fifty years later Galen left on record a summary of all these disputes by the numerous divisions which he established among the opponents and partisans of hydrotherapy. According to the physician of Pergamos, the practitioners of his time were divided into *hydrophiloi* and *hydrophoboi*. The *hydrophiloi* were subdivided into *psychrophiloi*, advocates of cold water, and *thermophiloi*, advocates of warm water. The first, the *psychrophiloi*, admitted three subdivisions,—the *psychrolites*, partisans of cold baths, the *psychropotes*, partisans of warm baths, and *psychropantes*, partisans of both modes of administration. Galen, moreover, was an advocate of cold baths, but he condemns their excess. He insists on the benefit which may be derived from cold water as a drink in fevers, and recommends ablutions of cold water to the head while the rest of the body is immersed in warm water.

Cœlius Aurelianus, who lived, or is believed to have lived, in the fourth century of our era, also indicates a new mode of employment of cold water,—namely, the application of sponges wrung out of cold water to

* "Destillationibus jecinore vitiato, ad desperationem redactus, contrariam et ancipitem rationem medendi necessario subiit, quia calida fomenta non proderant, frigidis curari coactus; auctore Antonio Musa" (Suetonius, "Vita Cæsar-Augusti").

the stomach of melancholic patients. We have seen this practice revived in our day.

There are also in Aetius and in Alexander of Tralles, passages proving that these physicians made use of lotions and affusions of cold water in fevers. I may here remark that you will find in the voluminous compilation of Oribasus, which I have many times cited, all the usages of antiquity pertaining to cold baths.

Then came the epoch of the Middle Ages, and, as it was with all that pertained to the arts and sciences, everything came to a standstill, during this period of barbarism, for a thousand years, and we are obliged to come down to the middle of the sixteenth century before we find any further indications of hydrotherapic practices applied to the treatment of diseases.

It is a singular circumstance that the Arabian school of medicine, which, during this period of the Middle Ages, kept the ancient tradition, and upon which the religion of Mohammed rendered obligatory repeated ablutions with cold water, did not enforce these ablutions as a part of medical practice. Rhazes alone counselled cold baths, and this as a part of the treatment for smallpox. Rhazes, whose true name was Bou-Bekr-Mohammed-Ben-Zakarya-Errazy, besides cold baths in smallpox, ordered astringent baths and cold drinks for metrorrhagia, and iced rose-water for burns.

In the sixteenth century—that is to say, at the epoch of the Renaissance—the medical world was but little interested in the subject of cold-water treatment. At the same time, I ought to mention that in Italy, Mercurialis, the restorer of the gymnastic art, did not overlook the importance of cold affusions in febrile maladies, and in Spain, Nicolas Mordanus dwelt at length on the usage of cold water and of snow in sickness. In France, Ambroise Paré applied cold water to surgery, and showed the benefits that may be derived from irrigation in the treatment of wounds.

But we must come down to the seventeenth century, and to the end of this century (1699), in order to find all these scattered notions as to the advantages of cold water summed up in a work entirely devoted to hydrotherapy, and it is an English physician, Floyer, who was the author of this treatise.* Floyer established at Litchfield, where he was practising medicine, the first institution for hydrotherapy, which consisted simply of two contiguous apartments. In the one sweating was obtained by wrapping the patient in warm blankets, in the other applications of cold water were made.

In the eighteenth century all these ideas as to the employment of cold water took more definite shape, and this whole question of the water treatment of disease began to be agitated among physicians. It was in Italy that the chief interest in the subject seemed to centre, and much excitement prevailed among the partisans and opponents of cold-water treatment, which a historian of the period characterizes in these words: "All Italy is crazy on the subject of cold water." This practice was brought into Italy by two Spanish monks, who ordered, in the treatment of diseases, the free drinking of ice-water (from six to forty glasses a day) and frictions with ice.

In Germany the Hahn family laid the foundation of hydrotherapy. The father of the Hahns, Sigismond Hahn, who was born at Schweidnitz, in that same Silesia which at a later day gave birth to Priessnitz, was an earnest advocate of cold water both internally and externally; but it was especially his son, Johann Sigismond, who in a manner laid down the principles of hydrotherapy, in a work which he published in 1743. He not only applied cold water to the treatment of chronic disorders, but also to acute affections and to exanthematic fevers, and in particular to smallpox, measles, and erysipelas.

His brother, Gottfried von Hahn, who practised at Breslau, and who was raised to the rank of nobility by the king of Prussia in 1717, did much less for hydrotherapy than his brother, and has left on record only the results of his practice.

At the same period appeared the first work in Russia on the usage of cold water, which the Russian people from time immemorial had made use of in sickness, and we owe this work to Samoilowitz, physician to the empress, Catherine II., who employed with success ice-water lotions in the treatment of the plague which raged at Moscow in 1771.

France did not remain idle in this scientific movement which led physicians to use cold water as a therapeutic agency. The surgeons, reviving the practice of Ambroise Paré, counselled the use of cold water in the treatment of wounds; and Récolin, Pibrac, De la Martinière, Louis, Poutier, Mopelier, Champeaux, Chambon, followed the example of Lamorier, of Montpellier, and Guérin, of Bordeaux, who,

* Floyer, "An Inquiry into the Right Use of Baths." London, 1699.

in 1732, vaunted the good effects of constant irrigation in the treatment of wounds. Three military surgeons—Lombard, Percy, and Larrey—made this a part of current practice in the treatment of wounds by fire-arms.

But the most ardent and vehement advocate of hydrotherapy was Pomme. All diseases of the nervous system were to him vaporous affections, and all were tributary to a uniform treatment, which consisted in immersing the patients for six, twelve, and sometimes twenty-four hours in water, kept at a constant low temperature of 10° C. [50° F.] by adding ice. According to Pomme, all vaporous maladies depend on "relaxation" or shrivelling of the nerves, and are to be combated by aqueous infiltration of those nerves, which swells them out again to their normal dimensions. Pomme, besides cold baths, subjected his patients to a debilitating regimen, giving them nothing but milk, barley-water, and chicken-broth.

But we must turn again to England if we would find a more rational and practical impulse given to hydrotherapy, and we owe this progress to Currie. Currie had a predecessor in this scientific movement by the name of Wright, who, in a voyage from Jamaica to England, had observed in his own person the good effects of cold-water applications during an attack of pernicious fever; he got well under the use of douches of sea-water, three pailfuls at a time, and he thereafter applied these ablutions of cold water to the treatment of fevers, and typhus in particular, and published, in 1797, the results of his observations.*

Currie, who practised in Liverpool, profiting by the experience of Wright, put his typhus fever patients upon cold-water treatment, and reported a hundred and fifty-three cases in which the recovery seemed to be due to the plentiful use of cold water. He employed affusions of sea-water or salt and water.

But where Currie showed himself superior to all his predecessors was in the fact that he laid down the principles of the physiological action of cold water in the febrile process, and he made the first physiological experiments to determine how cold water acts in health and in sickness. In order to give more precision to his observations, he made use of the thermometer, which he placed either in the mouth or in the armpit of patients, employing for this purpose a very sensitive instrument, graded much like those of the present day, so that he at the same time established the basis of hydrotherapy, and was the creator of clinical thermometry.†

The work of Currie is the most important and the most scientific work of the epoch on hydrotherapy, and on many points later researches have in no way diminished the value of the observations made by the English physician. In his writings, in which on every page he shows the benefits which may be derived from the employment of cold affusions in the treatment of febrile affections, Currie complains of the very meagre results which had attended his efforts to inculcate therapeutic methods of the utmost advantage to humanity. Currie was fully justified by subsequent events in giving expression to this lamentation, for his contributions to medical progress were destined to be so completely ignored that more than thirty years after his death the discovery of hydrotherapy was attributed to the empiric, Priessnitz.

All these facts, then, had passed into oblivion, and the important labors of Currie, to whom indisputably belongs the honor of having established hydrotherapy on an experimental and scientific basis, had been without fruit, when at the beginning of the nineteenth century Priessnitz appeared; and what could not be accomplished by the efforts of the most celebrated physicians for eighteen centuries—from Musa and Charmis down to Currie—a humble peasant and farmer effected. From this moment, hydrotherapy found its proper place in medical practice, and so universally since then have the principles of this mode of treatment spread, that at the present time there is scarcely a physician in the wide world who does not daily have recourse to practices of hydrotherapy. I know not, gentlemen, whether, like myself, you have ever been impressed with the melancholy fact, illustrated by the modern history of hydrotherapy, that it takes years of time and toil on the part of the leaders in medicine before any progressive movement of great sanitary and therapeutic importance is duly recognized by the profession at large, and one has often occasion to remark how difficult a task it is, and how much combined individual effort it takes, to overcome the apathy and indifference of the busy prac-

* Wright, "Medical Facts and Observations." London, 1797.

† Currie, "Medical Reports on the Effects of Cold Water as a Remedy in Febrile Maladies." Liverpool, 1797.

titioner or lead him to forsake the ruts of established routine.

But, before speaking of the "healer of Grafenberg" (as he is called), and of his hydrotherapic methods, I must mention a work which made a considerable stir at the commencement of this century. I refer to the treatise of Giannini on the "Treatment of Fevers by Cold Water," published in Milan in 1805. The Milan physician adopted the teachings of Currie, and treated fevers by cold water, but he substituted for the practice of Wright and Currie, which consisted of cold-water affusions, immersions in a cold bath, in which he kept his patients from ten to fifteen minutes at a time. Giannini applied this treatment to all fevers. Cold baths in intermittent fever combat the paroxysms, and in typhus keep the fever below the dangerous point; these were facts which Giannini had experimentally determined, and it may truly be said that in his application of cold baths to typhoid fever he was Brandt's predecessor by more than fifty years.

Vincent Priessnitz was born July 4, 1789, in one of the poor huts of the village of Grafenberg, which is situated at eighteen hundred metres of altitude, between Glatz and Neiss, near Friwaldau, in the mountains of Austrian Silesia.

Of an observing mind, long accustomed to make use of water both externally and internally in the treatment of sick animals placed under his care, Priessnitz had occasion to apply this mode of treatment to himself before prescribing it for any other human being. In 1816 he was thrown from a vicious horse, and suffered severe contusion of the left arm, besides two broken ribs. The surgeon whom he consulted declared that consolidation could not be obtained in the fractured ribs. Priessnitz, leaning his chest against the corner of a chair, and holding his breath, brought the broken fragments together, and had them maintained in position by a tight bandage, which he kept constantly wet with cold water, and consolidation was speedily effected.

Priessnitz attributed his recovery to this water treatment, and thereafter, accompanied by his cousin, Gaspard Priessnitz, roamed up and down the various country places of Silesia, treating by these same methods sprains, fractures, and all sorts of wounds and injuries in men and animals.

The success which attended this treatment made a great stir, and the reputation of Priessnitz was established. The hardy mountaineers, mind you, did not attribute to the water treatment the brilliant results which Priessnitz had obtained, but ascribed them to sorcery, while the physicians and veterinary surgeons denounced him, and the priests heaped upon him their anathemas.

Then his practice increased, and his methods underwent improvements, and soon from all parts of Europe patients flocked to Priessnitz to be treated. To accommodate this itinerant *clientèle*, spacious hotels were constructed, which superseded the poor hovels of the village of Grafenberg. The Austrian government, astonished at the success which attended Priessnitz's hydropathic mode of treatment, appointed a medical commission to examine into its merits, and this commission reported favorably, recommending its adoption by the medical profession.

Loaded with honors and become immensely rich, Priessnitz did not, however, seem to enjoy his good fortune; he encumbered his hydrotherapic practices with odd and incomprehensible formulæ to keep away the physicians who came from every quarter to learn his methods; he kept himself more and more aloof, and died without leaving any writings, or a single pupil worthy of him.

Priessnitz was guided by very strange physiological and pathological notions, not being a physician, and having never studied medicine. In his estimation, the body was like a sponge, more or less thoroughly impregnated by diseased humors, and the plentiful application of cold water internally and externally tended to wash out these humors and rid the body of its impurities. His mode of treatment comprised several particulars, to which I shall briefly allude. These were all summed up in regimen, aeration, and the internal administration of cold water. He absolutely proscribed all condiments, with the exception of salt. He also insisted that all food should be taken cold. No alcoholic beverages were tolerated at Grafenberg; tea and coffee were also interdicted. As for exercise, Priessnitz made a great account of it, but he forbade ordinary gymnastic exercises as likely to exhaust or otherwise do harm, and recommended joinery instead.

"At Grafenberg," says Schedel, "all the patients are provided with a saw, a sawhorse, and an axe. Young as well as old are compelled to split wood."

As for the internal use of water, the patients were obliged to drink from ten to forty tumblerfuls a day. Before dinner they drank four to six glasses, and two after dinner; the rest was drunk between meals.

Before applying cold water externally, Priessnitz had recourse to sudation. To obtain sweating, he wrapped his patients in warm blankets, and, when they were covered with perspiration, the cold-water applications were made. These were varied. There was, first, the full bath, in which the patient was immersed; then there was the partial-bath, in which the patient was placed, and water was splashed over him (this was followed by rubbing); next in order came the foot-baths and sitz-baths; and, lastly, the cold, wet compresses and the wet sheets. Priessnitz made little use of douches, employing only the jet douche.

Such was the complex treatment employed by Priessnitz, and which his inventive genius was able to vary to such an extent; and you will see, by referring to the work of Scoutetten, that the patients under his care were occupied from four o'clock in the morning in summer, and five o'clock in winter, till ten o'clock at night, in carrying out the many rules and directions of the empiric of Grafenberg.

From this moment hydrotherapy became a part of current practice in the different countries of Europe. Baldau, in France, in 1840, studied the methods of Priessnitz, and founded the first hydrotherapic establishment at the castle of the Arcade; then Scoutetten, in 1843, made known Priessnitz's methods; still later, Schedel, in 1845, published his work on hydrotherapy; while Lubanski, in 1847, made known the results of his observations at the hydropathic institute which he had founded at Pont-à-Mousson.* Lastly, Paul Vidar founded the great establishment of Divonne, Macario that of Lyons, Bottentuit that of Rouen, and Delmas that of Bordeaux, and thus a number of the cities of France came to be provided with hydrotherapic establishments.

But the institution which was destined to give to hydrotherapy its most scientific character was assuredly that of Bellevue, directed by Fleury, who opposed to hydrotherapy of an empirical nature a rational water treatment, the precepts of which are set forth in his remarkable work entitled "A Practical and Rational Treatise on Hydrotherapy," the first edition of which appeared in 1852.

* Baldau, "Practical Instruction on Hydrotherapy," Paris, 1846; Scoutetten, "Water in its Hygienic and Medical Relations: a Treatise on Hydrotherapy," Paris, 1845; Schedel, "A Critical Examination of Hydrotherapy," Paris, 1845; Lubanski, "A Practical Study of Hydrotherapy," Paris, 1847.

Fleury endeavors to place rational hydrotherapeutics at the head of physiological therapeutics, and bases his practice on physiological experiments conducted with the utmost scientific rigorousness. He repudiates the employment of warm water and tempered water, and abandons sudations, at least in part; but, on the other hand, he multiplies the forms of douches, and considerably augments the arsenal of hydrotherapy.

Having finished the historical part of our subject, we come to the physiological effects and clinical applications. This will be the topic of the next lecture.

II.

PHYSIOLOGICAL EFFECTS AND MODES OF APPLICATION OF HYDROTHERAPY.

The physiological effects determined by the application of cold water have been the subject of numerous works these late years, and from these treatises I shall glean the materials for this lecture. I must allude in particular to the interesting researches made in France by Delmas, of Bordeaux, by Thermes and De Bottey, of Divonne; to those of Fredericq, of Liège, in Belgium; and especial attention should be called to the memoir of Scheuer, of Spa. I must also acknowledge my obligations to the splendid work of Winternitz, of Germany, and the numerous and fruitful experiments of Roehrig, of Rosbach, and of Fleischl.† I shall take these works as my guide in the brief survey which I shall here make of the physiological effects of hydrotherapy.

In this lecture I shall study only the action of cold water in its momentary effects on the cutaneous surface, leaving to one side the prolonged effects of this agent which constitute its antithermic action; this latter subject I shall take up in the last lecture on hydrotherapy, which will be devoted to the treatment of acute febrile maladies by cold water.

When cold water is applied for a brief space

† Delmas, "Physiologie nouvelle de l'Hydrothérapie," Paris, 1880; Bottey, "Études médicales sur l'Hydrothérapie," 1886; Thermes, "De l'Influence de l'Hydrothérapie sur le Nombre des Globules du Sang," Paris, 1878; Scheuer, "Essai sur l'Action physiologique et thérapeutique de l'Hydrothérapie," Paris, 1885; Winternitz, "Die Hydrotherapie auf physiologischer und klinischer Grundlage," Wien, 1880; Roehrig, "Die Physiologie der Haut experimentell und kritisch bearbeitet," Berlin, 1876; Rosbach, "Lehrbuch der physikalischen Heilmethoden," Berlin, 1882; Fleischl, "Untersuchungen über die Gezetze der Nervenerregung," Wien, 1878.

of time (by douches, plunges, baths) to the integument, it causes a train of symptoms which all of you have experienced when you have taken for the first time a cold plunge. Under the influence of the cold application, the individual experiences at first a sense of distress which is sometimes very painful. The beatings of the heart become irregular; the respiration is interrupted; there is a sensation of chilliness which extends over the surface of the whole body; the skin becomes pale, takes on a purplish hue, and there is a general shivering. Then, with the cessation of the action of the cold, these phenomena rapidly disappear; there is now a sense of general comfort, the circulation becomes more active, the respiration fuller, the skin reddens, the surface becomes warm, and there is a feeling of vigor and resistance which is very pronounced. It is to the sum of these phenomena that the name of *reaction* is given. Such are the symptoms of the cold-water application when it is of short duration.

But in order well to understand the physiological effects of the cold douche, it is necessary to examine each of these phenomena separately, and this is what we will now do, taking up successively the action of cold water on the circulation, on the respiration, on calorification, on innervation, and on nutrition.

Under the first head, we shall have to examine the action of cold water on the capillary and peripheral circulation, then its effects on the heart, and, finally, its action on the composition of the blood.

With respect to the capillary circulation, the action of cold when it is but transient is very perceptible; it constricts the calibre of the vessels of the cutaneous net-work, then, when the action of the cold has ceased, to the primary contraction succeeds a dilatation which is produced at the moment of reaction. But in order to obtain this active contraction and the subsequent dilatation, the action of the cold must be of very brief duration.

It is by the intermediation of the nervous system and by reflex action that this constriction of the capillary net-work is brought about; it is, in fact, due to a twofold cause, since we now admit vaso-constrictor as well as vaso-dilator nerves. The transient action of the cold energizes the functions of the vaso-constrictors and inhibits the vaso-dilators; at the moment of reaction the opposite effect is produced,—the vaso-dilators enter into play and the vaso-constrictors are inhibited.

This knowledge of the effect of cold on the peripheral circulation is based on rigorous physiological experiments. I will touch rapidly on those of Naumann and Schüller, and shall dwell more particularly on those of François Franck.*

Naumann's experiments were made on the frog. Separating all the parts of the posterior extremity so that the limb remained attached to the body only by the sciatic nerve, he applied cold or mechanical irritation to the member thus detached, and observed under the microscope the effects thus produced on the mesenteric circulation. He then noticed that whenever the excitation was slight, or the action of the cold transient, there was a diminution in the capillary circulation, while, on the contrary, when the action of the cold was prolonged or too severely irritating, there was a dilatation of the vessels. This experiment is, as you see, one of great interest. It sets in clear light the rôle of the nervous system in the modifications undergone by the circulation when, for a longer or shorter space of time, cold is applied to the cutaneous surface.

Schüller experimented on the hare. He applied cold to the exterior by throwing a jet of cold water upon the belly and back of this animal; then he watched the effects produced on the pia mater, and observed, as before, that when the action of the cold was of little duration, there was a contraction of the capillary net-work, which gave place to a dilatation when the action of the cold had ceased.

But the experiments of François Franck have furnished us data of the greatest interest and value with regard to the peripheral circulation: first, because they were performed on man, and, secondly, because he made use of an apparatus which enabled him to determine with mathematical accuracy and even to enregister the modifications of the circulation.

François Franck,† in his experiments, employs an apparatus devised by Buisson, a sort of *plethysmograph*, which is a modification of the apparatus which Piégu first invented for studying the movements of expansion of the limbs. The hand of the subject is placed in a hermetically-closed vessel full of water; it is immovably fixed in this vessel, and the augmentation or decrease in size of the member causes a variation in the level of the liquid,

* Naumann, "Untersuchungen über die physiologischen Wirkungen der Hautreize;" Prager, *Vierteljahrsschrift*, Band 77; "Zur Lehre von den Reflex;" "Reizen und deren Wirkung;" *Pfluger's Archiv f. Physiologie*, v., 1872.

† Labors Undertaken in the Laboratory of Marey, 1878.

which is transmitted by a registering drum. When to the right forearm of the subject ice is applied, while the left hand is fixed in the enregistering apparatus, there is produced at the end of two or three seconds a diminution in the volume of the left hand ; this shrinkage increases little by little, attains a certain point, then gradually disappears, and at the end of a minute the hand has regained its former volume.

By an attentive analysis of the phenomenon, François Franck shows that it does not result from any primary action of cold on the heart affecting secondarily the hand, but from a reflex act, having its starting-point in the impression of cold on the skin of the right forearm, its point of reflection in the spinal cord, and its destination the vascular nerves of the left hand. Mosso has repeated these experiments with the same apparatus, and has arrived at the same results. This experiment sets forth clearly the action of cold when applied momentarily to the skin, showing with what certainty this agent effects the diminution of the peripheral circulation.

Physiologists have gone even further in the prosecution of researches of this sort, and Winternitz has endeavored to ascertain by experiments, rigorously conducted, what are the points of the skin which have, above all, an elective action on the circulation of a determined vascular area. He has shown that the application of cold to the foot occasions chiefly a fall in the intercranial circulation ; cold applied to the thighs, on the other hand, affects most the pulmonary circulation, while cold to the back influences in a marked manner the pituitary membrane. These are facts of the utmost importance, which we shall utilize hereafter when we come to study the applications of hydrotherapy to local diseases. Chapman has even gone so far as to take this elective action of different parts of the spinal cord on the vascularization of certain organs as the basis of a therapeutic method, which consists in applying along the vertebral column and over determined points bags of hot water or of ice. Allow me also to remind you that the experiments of Winternitz give sanction to the popular practice of arresting nose-bleed by applying some cold substance to the back.

The action of cold water on the heart is also a subject of great interest, and has given rise to numerous experiments to which I ought to allude before going any further. Roehrig has given especial attention to this subject. He experimented on the hare, and on applying mechanical irritants or cold to the ear of the animal, examined the effects produced on the heart, and he has thus demonstrated that transient cutaneous excitations augment the beatings of the heart, while strong or very prolonged excitations diminish the number of pulsations.* The experiments of Winternitz and of Delmas are still more conclusive, as these two observers made man their subject. According to Winternitz, when cold is applied to a limited surface of the skin, there is an increase in the beatings of the heart, lasting three minutes, then a progressive decrease.

Delmas undertook in 1869 and 1870 researches and experiments characterized by still greater precision, showing by tracings all the modifications which supervene when a douche is administered. As soon as the cold water touches the body the heart is violently excited, and the pulse becomes irregular and precipitate. To this augmentation of pulsations succeeds a diminution below the normal, a diminution which takes place and is prolonged during the period of reaction. These facts, gentlemen, are of great importance. They show, first, what risk we run in subjecting to hydrotherapic treatment persons suffering from cardiac affections. These dangers are not imaginary, and cardiopathic patients have been known to die suddenly under the first effects of the douche. Therefore Priessnitz, who had on more than one occasion witnessed disastrous consequences of this kind, resolutely refused to submit to the douche patients who complained of palpitations or of cardiac or pulmonary oppression. Not being a physician, he did not distinguish anæmic patients from those laboring under real heart-disease,—a distinction of the highest importance, for hydrotherapy is interdicted to cardiac patients, while positively indicated in anæmia. This leads me to speak of the effects of cold water on the composition of the blood.

It is to Thermes that we owe investigations which have given us our knowledge of this subject.† Making use of the processes of numeration and calorimetry devised by Hayem, and which have given a rigorous precision to his studies, he has shown that cold water augments not only the number of the globules, but also their physiological value.

The action of the douche on respiration

* Roehrig, "Die Physiologie der Haut experimentell und kristisch Bearbeitel." Berlin, 1870.

† Thermes, "On the Immediate and Mediate Influence of Hydrotherapy on the Number of Red Globules of the Blood." Paris, 1878.

has been much less studied, and the results of experimenters are contradictory. Johnson affirms that under the influence of a cold shower-bath of one minute's duration, the number of inspirations augments from two to eight per minute. Pleniger also has observed the same increase. According to Delmas, there is sometimes increase, sometimes diminution in the number of respirations, and there is no precise rule. As for myself, I have often witnessed these phenomena of the respiration under the influence of the douche, and can affirm that at the commencement of the douche there is first arrest of the respiration, then several long inspirations succeed, and when the period of reaction is established, the respiratory movements are augmented in number and intensity.

Naturally, this double action of cold water on the circulation and on the respiration entails modifications in calorification. But these modifications under the influence of the douche are at first but slight, for while one experiences a severe sensation of cold while the water is being projected upon the body, and of general warmth when the action of the cold has ceased, the thermometer scarcely indicates a fall of two-tenths of a degree. But what is somewhat singular, during the period of reaction this fall of the temperature goes on, and is the more marked if the individual takes exercise, and may attain one degree C. (the mean is 0.6° to 0.8° C.), continuing for two hours after the douche.

The experiments which Delmas has made with extreme exactness as the basis of these data are accepted as conclusive by all physiologists, and show us once more that it will not do always to assume the sensations of heat and cold which we feel at the surface as really indicative of the temperature of the body. Does not the period of chill in intermittent fever coincide with an elevation of the temperature? It is the same with regard to the effects of hydrotherapy, and while during the period of reaction it seems to us that the heat of the body has considerably augmented, and that this augmentation increases with movement, this is not the case, and the thermometer gives, on the contrary, a decrease in the bodily temperature.

Bottey ("Medical Studies in Hydrotherapy," Paris, 1886), in some recent experiments made to elucidate this subject, has shown that this fall in the temperature depends on the duration of the douche and the temperature of the water. When the douche is very cold (8° C. for example) and of short duration (two to three seconds), the depression of the temperature is preceded by a short period of elevation,—one- to two-tenths of a degree,—but when the douche exceeds ten seconds we come under the conditions determined by Delmas, and the depression of the temperature, which varies from four- to five-tenths of a degree, is prolonged for several hours without any momentary reactionary elevation.

Hydrotherapy has a marked action on the nervous system. The reflex phenomena determined by the impression of cold on the skin bring into play the nerve-cells of the spinal cord, and effect an equilibrium between the cerebral and spinal functions. Cold applications also modify the cerebro-rachidian circulation, and we shall see that, according to the mode of application of the cold water, we may obtain either effects of excitation and tonicity or of sedation and calm.

Acting on the general and partial circulation, augmenting the globular richness of the blood, modifying respiration and calorification, determining effects of an indisputable character on the cerebral and spinal functions, hydrotherapy influences, in all these ways, the general nutrition, which it notably enhances; and Scheuer* has insisted long and justly on this point. He shows that the blood, driven from the surface under the first effects of the douche, is forced into the different viscera, and in particular into the hæmatopoëtic organs, then that it returns to the periphery during the period of reaction, when the enhanced activity of the capillary circulation augments the chemical combustions there taking place. All our tissues, then, participate in the invigorating action of hydrotherapy, and you readily understand how it is that we have found in cold water, thus applied in a sudden and temporary manner to the surface of the body, one of the most powerful means for energizing the general nutrition.

We come now to the usual modes of application of cold water.

Hydrotherapic processes are extremely numerous, and in order to describe them in a clear and methodical manner I shall be obliged to establish numerous divisions. One of these has to do with the force and pressure of the water, and we shall have to examine the processes of hydrotherapy with

* Scheuer, "On the Physiological and Therapeutic Action of Hydrotherapy in Chloro-Anæmic States." Paris, 1885.

pressure—*i.e.*, douches and affusions—and processes where the water is applied without pressure. Another division is based on the temperature. In fact, we restrict hydrotherapy largely to the application of cold water, and you will see that all the degrees of temperature of water are utilized, from ice-cold to hot-vapor baths.

Let us begin, if you please, with the first division,—*i.e.*, water utilized under greater or less pressure. To this head belong affusions, and especially douches.

Affusions are but little used; this is the primitive method which Wright, more than a century ago, employed in the treatment of febrile affections. You see this method still put in practice at the seaside sanitaria. It consists in pouring, or projecting with more or less force, one or more pailfuls of water over the naked body of the patient.

As intermediate between the affusions and douches properly so called, we may mention the *swan's-neck douches* and the *surge douches* (*douches en col de cygne et douches en lame*). The *swan's-neck douche*, which derives its name from the form of the tube which conveys the water, projects upon the neck of the patient a great volume of water. In the *surge douches* a considerable mass of water is made to fall upon the patient, giving him the impression of an enormous billow.

Douches constitute the most essential part of hydrotherapy, at least in France; for we may, in this respect, establish a difference between the hydrotherapic practices of this country and those of Germany. Faithful to the practice of Priessnitz, Germany makes great use of partial baths, of wet wrappings, and frictions with wet cloths, while little account is made of the douche. In France, on the other hand, under the influence of Fleury, the douche has taken a preponderant part in hydrotherapy,—so much so that the words are, with us, almost synonymous.

Douches are divided into general and partial; the general are subdivided into fixed and mobile douches. This division is based, as you see, on the different modifications which are effected in the pipe which serves to administer these douches, the word *pipe* (*tuyau*) being, in Italian, *dossia*, from which we have derived the name of *douche*.

The fixed douches the most employed are the shower-bath (*douche en pluie*) and the columnar douche (*douche en colonne*). Almost universal usage is made of the shower-bath. A sprinkling-ball (*pomme d'arrosoir*), furnished with a great number of holes, varying from two hundred to three hundred, each having a diameter of from one to two millimetres, gives issue to the water, which falls in a fine shower upon the nude body of the patient.

The columnar douche consists in a vertical jet of water, which falls in a full stream, first on the head and then on the body of the patient. I shall not speak of the concentric spray douches (*douches en lames concertrèques*), nor of the *sheet* or *bell douches* (*douches en nappe ou en cloches*), because they are but little in use at the present day.

As for the mobile douches, they are administered by means of a flexible tube with various terminal adjustments. The jet most employed is the simple jet, which may be broken either by means of the finger of the operator, or of a pallet adapted to the tip.

As for the partial douches, they are very numerous: vaginal douches, lumbar douches, rectal douches, etc.; all these douches are administered by a particular arrangement of the tubing, which enables one to limit to a given point of the body the action of the cold water.

There is a partial douche often put in usage, and described under the name of *circular douche* (*douche en cercle*). It is an apparatus which you will find in all the well-equipped hydrotherapic establishments, and consists in a peculiar framework, with a number of circles or rings, which deliver the water in a shower upon the body of the patient placed in the midst of these circles. There are stop-cocks which enable one to limit the action of the water to a given number of circles.

We come now to the action of water without pressure, and here we have two great divisions. Sometimes the patient is immersed in a certain quantity of water, sometimes the water is applied to the body in small quantity by means of sponges or cloths. The first subdivision is represented by the piscina and the bath. The piscina (*baignoire*) may be of greater or less size, with running or standing water. As for the bath, it varies also according to the circumstances, and may be general or partial, with running or standing water (foot-baths, sitz-baths, etc.).

Priessnitz made much use of the half-bath, and his practice is still in vogue in Germany. Glatz* affirms even that he derives good results therefrom in relieving the pains of tabetic patients. This is the way this bath is

* A Technical and Practical Study of Hydrotherapy. Paris, 1887.

administered: The patient is placed in an ordinary bath-tub partly full of cold water During the bath the attendants make cold-water affusions over the whole body and practise energetic frictions with the water of the bath. The duration of the bath varies from five to fifteen minutes.

At other times the water is applied by means of a sponge. Lotions of cold water and sponge-baths have passed from the domain of medicine to that of hygiene, and the people of the north practise them constantly, especially the English, who, in their fondness for their bath-tubs, are in the habit every morning of taking a thorough rub-down with a sponge dipped in cold water.

At other times these frictions of the whole body are made with a cloth wrung out of cold water. On other occasions the entire body is wrapped in a cold wet sheet. This wet wrapping will render you great service in your private practice whenever, as in the country and in small cities, you cannot obtain the proper hydrotherapic apparatus. These cold-water wrappings are made as follows: You take a thick sheet, which you dip in a pail of cold water and wring out; then, the patient standing, you envelop him from head to foot in this wet sheet. In cases where there is tendency to congestions of the head, or in women where there are visceral congestions, you take care at the same time to immerse the feet of the patient in warm water. The duration of the wrapping ought not to exceed fifteen to twenty seconds. The wet sheet is then removed, the patient is wrapped in a dry dressing-gown, and by energetic frictions reaction is favored.

Just as we have general and partial douches, general and partial baths, so also these applications may be general or partial, constituting wet packs, half packs, wet swathes. Priessnitz made use of both sedative and excitant compresses; to obtain a sedative effect, the compresses were renewed so as to oppose reaction; to produce an excitant effect, they were left in place so as to determine a very active reaction.

The wet swathe consists in a large piece of cloth, long enough to go three or four times round the body; the end of the swathe is wet in cold water and then applied over the epigastrium and lower abdominal regions, and over this the remaining dry portion of the roller is passed in three or four turns. It is to the same process applied to the entire body that the name has been given of *wet pack* or *half pack.*

This is the way of applying the wet pack, or the half pack, the latter covering only the trunk and leaving the limbs free, the former, on the other hand, covering the whole body: On a hair mattress you spread a woollen blanket, and over this a wet sheet, which has been thoroughly wrung out of cold water. The patient is placed on this sheet, which is tightly wrapped around him, and over this is folded the dry blanket. You do not wish in this case to obtain the ordinary effects of cold, but rather a profuse sweating, therefore the patient is left in the wet packing two or three hours, diaphoresis being favored by spreading over all an eider-down coverlet. At other times the patient is simply wrapped up in a dry blanket and covered with abundant bedclothes; this is what is described as the *dry pack.*

As you see, gentlemen, hydrotherapy is not quite synonymous with cold water. It comprehends, on the contrary, applications of water at all grades of heat, and this is what leads me to the second division of my subject,—namely, hydrotherapy with water at various temperatures. But, in order that we may be agreed as to the precise sense in which modifications of temperature should be understood, I here reproduce Delmas's thermometric table, which gives the degrees on the Centigrade and Fahrenheit scales corresponding to the terms in common use in hydrotherapy:

	C.	Fahr.
Excessively cold	0° to 6°	32° to 42.8°
Very cold	7° to 10°	44.6° to 50°
Cold	11° to 15°	51.8° to 59°
Moderately cold (*fraîche*)	16° to 20°	60.8° to 68°
Slightly cool (*dégourdie*)	21° to 25°	69.8° to 77°
Tepid	26° to 30°	78.8° to 86°
Warm	31° to 35°	87.8° to 95°
Very warm	36° to 40°	96.8° to 104°
Excessively warm	41° to 60° or 70°.	105.8° to 140° or 158°.

A given temperature may be constant during the douche or bath, or it may be made to vary. In the first case, we have the cold, the tepid, the warm bath; in the second, the Scot bath, the douche with decreasing temperature, the alternating douche, etc. If the cold bath is the most employed, you will see, as we go on, that the tepid bath, the warm bath, etc., may render us great service.

The douche with decreasing temperature is much in usage. It is especially applicable to nervous patients, who experience, under the influence of cold water, too great a shock, the bath being actually painful to them.

You begin the douche with warm water, and you rapidly lower the temperature by

bringing into play other (colder) jets, so that at the end of the douche the water is cold. This is an excellent mode of employing hydrotherapy in the beginning of treatment of delicate, sensitive patients.

The Scot douche, which is much in vogue, consists in employing water of 30° C. at the commencement of the douche, the temperature to be gradually raised to 40° C., and even to 50° C. For one or two minutes the higher temperature is maintained, then the *séance* is terminated by a cold-water douche of several seconds' duration.

In the "alternating douche" jets of warm water are made rapidly to succeed jets of cold water. Care is taken always to commence with the warm-water jets.

We come now to the applications of water in the state of vapor and to hot-air baths, which belong rather to the department of balneotherapy than to that of hydrotherapy; therefore I shall treat this subject very briefly. We have, first of all, the hot-air chamber, which is filled with hot moist or hot dry air, according as use is made for purposes of sudation of hot air alone, or of hot air impregnated with vapor of water. These closets may be of considerable size, so as to admit at the same time one or more individuals, or they may be mere boxes, in which the body and limbs are encased, the head remaining outside of the apparatus. The latter means of promoting sudation, to which the French term *étuves partielles* is applied (the general term *étuve* (stove) being used to designate the hot-air chamber), is one in very common use, though ordinarily, in private practice, a more simple way of effecting diaphoresis is employed. The subject is seated on a wooden chair, whose seat is perforated with from fifteen to twenty holes, and which is furnished with a vertical perforated board between the front legs of the chair and a stool for the feet to rest upon. The patient is then covered with blankets, which are made to enclose the chair as well; then underneath the chair is placed a spirit lamp, with numerous burners, capable of evolving a great amount of heat. Sometimes a basin of water is heated over the lamp, thus giving rise to a great volume of steam and constituting a primitive vapor-bath. This mode of producing sweating requires but simple apparatus, which can be extemporized on almost any occasion.

The administration of the hot moist-air baths may be briefly interrupted by a cold bath or a hot-water bath. The one constitutes the Russian, the other the Turkish, bath. In the Russian bath, the patient is admitted into a hot moist-air chamber in which there are benches of variable heights surmounting each other. The higher the subject is seated on these benches the hotter the temperature, which varies between 36° C. and 75° C. [The steam is generated in Russia by pouring water on heated stones, but elsewhere, in a boiler, whence it diffuses itself through the chamber.] Then, when the whole body is covered with sweat, the patient takes a plunge in a tank of cold water, or else receives a cold douche.

The Turkish or Hamman bath is somewhat different. The patient, instead of entering a moist chamber, is admitted into a hot, dry-air compartment, with a temperature between 40° and 80° C. Then he is subjected to warm-water applications and a prolonged massage. These kinds of baths have of late years acquired considerable popularity, and you will find in Paris a great establishment which responds to all the exigencies of hydrotherapy and balneotherapy.

Lastly, I must remind you that there are vapor douches, which are administered by a flexible tube communicating with a reservoir in which the water is in a state of ebullition.

I shall have finished this long and tedious enumeration of hydrotherapic processes when I shall have mentioned the method of Chapman. You remember that I have told you before that ice has been vaunted as a hydrotherapic agent. Chapman has instituted a complete therapeutic system which consists in employing bags of ice containing one or more compartments, these bags to be applied over various regions of the spinal column, according to the organ which he desires to influence. Chapman has mapped out these regions with great precision, taking as his basis data furnished by the researches and experiments of Claude Bernard and Brown-Séquard, and utilizing our knowledge of all the medullary nervous centres. Such, in their aggregate, are the measures of hydrotherapy which are in usage. These methods may be all brought together under one roof, constituting a vast hydrotherapic institute, such as all our great cities now possess, or the principal and more important of these means may be employed in the houses of your patients by means of those movable apparatuses with which you are acquainted.

While recognizing the great advantages which the special hydrotherapic establishments present, and this not only on account

of the precision and the multiplicity of apparatus put in usage, but also, and chiefly, by reason of the skill, expertness, and general competence of the medical men at the head of these establishments, it must be owned that in a great many instances you may obtain just as good results with the mobile apparatuses or douches which to-day form part of almost all the bath-houses, while the more elaborate establishments have their special use in the more difficult and delicate cases.

Like every other therapeutic system, hydrotherapy has had enthusiastic partisans of certain exclusive modes of cold-water application, and while Priessnitz made especial use of the wet pack; of the half-bath, and of a rigorous regimen, we see Fleury and his school make almost exclusive use of the cold douche, rejecting entirely the warm or tepid baths; while still more recently, under the influence of Landry and Beni-Barde, warm and lukewarm douches are very much employed.

These varied modifications thus given to hydrotherapy are not merely the results of a passing fashion, but they also find justification, as Beni-Barde has shown, in the variable medical constitutions which have prevailed since the time of Priessnitz.

Who were the patients that flocked to Grafenberg at the time when Priessnitz was at his zenith of popularity? They were gouty, rheumatic people, high livers, and it is easy to understand the prodigious success which Priessnitz obtained in these cases with his hydrotherapic procedures, the rigorousness of his dietary system, and the forced exercise to which he subjected his patients.

Then, a little later, came Fleury, who found himself in the midst, not of gouty, but of anæmic people, to whom the cold douche, skilfully applied, brought a rapid amelioration. In our day, diseases of the nervous system predominate, and the number of neuropathic patients increases from day to day. Here the methods of Priessnitz and of Fleury completely fail, while, on the other hand, warm water fulfils special indications which relieve these nervous states. Hence the success of the method first advised by Landry and followed out by Beni-Barde.

I have finished what I had to say concerning the physiological effects of cold water and its different modes of application. In the next lecture we will try and turn these data to practical account, and will take up the indications and contraindications for hydrotherapy as applied to the treatment of chronic diseases.

CARBOLATE OF CAMPHOR.

By M. B. Cochran, M.D., Shonond, Wis.

I USE this name because I know of no other that so fully describes the mixture under consideration. It is prepared by dissolving camphor in a ninety-five per cent. solution of carbolic acid to saturation. The carbolic acid will dissolve about three times its weight of camphor, and the resultant is a thin, clear, oleaginous mixture, having a strong odor of camphor and a very faint odor of carbolic acid. To the taste it has a strong and, at first, slightly-pungent flavor of camphor, but no flavor of the acid. Taken internally, in 10-drop doses, administered in capsules, it produces a sensation of warmth in the stomach which is not unpleasant, and which continues for an hour or two. When applied to the skin it produces a slightly-warm sensation for a few moments, and when applied to an abraded surface it smarts for a moment, and then all pain ceases. When two or three drops are injected under the skin a stinging is felt for a moment, which is followed by complete anæsthesia of the immediate neighborhood. When mixed with an equal quantity of cotton-seed oil, and applied to a fresh wound on gauze or cotton and kept well covered, no suppuration follows,—or has not when I have used it in this way. No vesication or pain follows its use when used in this way, or applied either to the skin or mucous surfaces. I have been using it for several months, and I submit a few cases in which it has been of marked benefit:

Mrs. P. came to me with herpes of the right leg,—numerous clusters of blisters over the entire leg and thigh, which were very painful. One thorough application of the mixture with oil caused an entire cessation of the burning, itching, and pain. No new clusters appeared, and desiccation began at once in the old ones, so that in four or five days the patient was well. Nothing else was used. I removed a large fatty tumor from the right arm of Mrs. P. The incision was five inches in length. I dressed the wound with carbolate of camphor and oil, applied on gauze, and it healed without pain or suppuration.

Wm. S. was struck with a knife, the blade of which entered the skin over the superciliary ridge of the right side, passed downwards, laying open the upper and lower eyelids, entered the eyeball on the lower side, and passed through the inferior orbital plate. He was brought to me, two weeks afterwards,

with a suppurating eyeball and lids ununited. The left eye was beginning to sympathize with the right, and was painful and sensitive to light. I removed the right eye, and dressed the wound with carbolate of camphor. All trouble of the left eye ceased at once, and no pain followed in the right; and in two weeks I fitted the patient with an artificial eye, and he returned to his home.

August A. came to me with his neck encircled with boils that were exceedingly painful. He had one also on his left wrist. Two of those on his neck and the one on his wrist were about ready to suppurate, and the others were just forming. I injected them all with carbolate of camphor, mixed with an equal quantity of sulph. ether. The pain ceased at once. Two on his neck and the one on his arm went on to suppuration, and, three days later, I opened them. The others were aborted, and he had no trouble afterwards. I gave him, however, a teaspoonful of a saturated solution of magnesia sulph. every morning before breakfast in a tumblerful of hot water.

Mrs. J. came to me with an acrid vaginal discharge that had existed for three years, which caused a vulvar eruption, with intense pruritus vagina. It followed the menopause, and her life had been one of utter wretchedness in consequence. She also had severe gastric catarrh, with profuse mucous discharge from the stomach. Anorexia, foul breath, and the fæcal evacuations were horridly fetid. Her health was broken, and her nervous system in such a condition that her friends feared insanity. I gave her 5 drops of carbolate of camphor three times a day after eating, and applied carbolate of camphor on a cotton-ball to the os uteri once a week, leaving it for twenty-four hours, and following it with daily irrigations of the vagina with hot water. In about one week the foul breath left her, the abnormal fetor of the alvine evacuations ceased, and the pruritus was cured.

The foregoing are only a few of the cases in which I have used it. It melts readily with vegetable oils and with vaseline, mixes with sulphuric ether, dissolves salicylic acid, cocaine, iodoform, and in a solution of forty grains to the ounce of the latter hides its horrible odor. I believe that with it all the antiseptic properties of carbolic acid, camphor, salicylic acid, and iodoform can be secured without pain or irritation, and that its use, both internally and externally, may give us most excellent results.

November 2, 1887.

*INTERMITTENCE IN DISEASE.**

By E. W. Holmes, M.D., Philadelphia, Pa.

PERIODICITY is one of the most extraordinary of all vital phenomena. Linked with the earliest development, it continues manifest through all the varied phases of somatic activity, and ceases entirely only with life itself.

Intermittence has, by some, been limited to the peculiar functional activity inherent in the nature of an organ modified but not induced by external influences.

Periodicity would then only be occasioned by the presence anew of a pre-existing cause, external to the economy, and independent of its influence, its phenomena not being autogenetic, but at each access occasioned anew by the primary cause.

Both terms express the idea of alternation, but intermittence rather gives us the impression of a temporary pause, or a failure of phenomenon, the cause being annulled, weak, or latent, while periodicity predicates a finished cycle, with a promise of return, the cause being enduring and efficient. Periodicity is, therefore, more properly applied to the evolutions of nature and the phenomena of health, while intermittence, as it were an evidence of debility, pertains to the rhythm of disease. Ordinarily, in the domain of medicine, the terms are not thus restricted, but are often used interchangeably.

An ostensible cause of physiological periodicity would be the influence upon us of seasonal and diurnal changes. Thus Darwin ("Descent of Man," p. 204):

"All vital functions tend to run their course in fixed and recurrent periods, and with tidal animals the periods would probably be lunar, for such animals must have been left dry or covered deep with water, supplied with copious food or stinted, during endless generations, at regular lunar intervals. If, then, the vertebrata are descended from an animal allied to the existing tidal ascidians, the mysterious fact that with the higher and now terrestrial vertebrata, not to mention other classes, many normal and abnormal vital processes run their course according to lunar periods, is rendered intelligible. A recurrent period of approximately the right duration, when once gained, would not, as far as we can judge, be liable to be changed; consequently it might be thus transmitted during

* Read before the Northern Medical Society of Philadelphia.

almost any number of generations. This conclusion, if it could be proved sound, would be curious, for we should then see that the period of gestation in each mammal, and the hatching of each bird's eggs, and many other vital processes still betrayed the primordial birthplace of these animals."

Again (idem, p. 31):

"The homological construction of the whole frame in the members of the same class is intelligible, if we admit their descent from a common progenitor, together with their subsequent adaptation to diversified conditions. On any other view the similarity of pattern between the hand of a man or monkey, the foot of a horse, the flipper of a seal, the wing of a bat, etc., is utterly inexplicable. *It is no scientific explanation to assert they have all been formed on the same ideal plan.*"

A plausible assumption and withal enticing, but open to the objection which obtains against the whole doctrine of *radical* evolutionist theory,—viz., special pleading,—a deft incurvation of facts to suit a preconceived idea; a proving of the assertion by pushing out of view the contrary; a spurious attempt to evade as long as possible a primal cause, which, in the event, has to be admitted after all. Similarity of structure by no means declares, of necessity, corporeal unity of origin or of descent, and analogy of function indicates comprehensive design.

Evolution is the unfolding of a glorious plan, with uniform and progressive gradation, which by no means sets bounds to the creative ability. The mere fact of periodic phenomena within and around us proves a parallelism,—a similar working of the same great mind, and not their interdependence. The denunciation, "*not scientific*," is neither demonstration nor confutation.

Admitting the influence of seasonal changes upon us, this only signifies that a part of the economy *responds* to stimulus from without, but does not show that this stimulus originates the power or method of response. Such influence is almost a directing agency, from which the capability of response is well defined, and I care not whether you consider it an endowment of our present system, or trace backwards to the Amœba, or to the ultimate forces of nature, the original atom must have at some time, somewhere, implanted in it this power of action, and of rhythmic action, which is, therefore, of original impress. We must clearly distinguish,—(1) a capability, (2) its provocative, (3) its additional and peculiar quality of rhythmic performance.

All of our functions may be said to be periodic. This is based upon the indestructibility of matter; it is really an outcome of its molecular solubility. Every function must have its period of rest and activity,—a tribute to our fallen nature. Each part to do its duty well must have its time for repose, without which it would soon become exhausted, the vital bond dissolved, and death ensue. This is the beginning and cause of periodicity.

It is, then, a natural endowment, a gift to the body, and not a faculty acquired from without, and is shared in common with the universe of matter around us, and is an evidence of temporary existence. "And there shall be no night there; and they need no candle, neither light of the sun; for the Lord God giveth them light" (Rev. xxii. 5), is a prophecy not only that we shall put on immortality, but that there shall be a cessation of periodic phenomena and a persistence of cosmic facts unknown to our sphere.

I would not, moreover, have you forget that many of our functional periods are the result not of original bent but of habit. That acts frequently repeated may become periodic, and many of our bodily needs with fixed intervals of expression, may be affirmed to be nothing more than the results of glandular sensations,—mere assertions of an educated reflex, and hence dependent upon intrinsic causes and conditions. Thus, the feeling of hunger recurring at certain hours is probably subordinate to the reflection of the glands of the stomach, which passes away as they are relieved of their secretions. Certain irritative dyspepsias are accompanied by a feeling of hunger directly after a meal, due, I dare say, to the presence of food causing abnormal irritation and congestion of the follicles, in like manner as the sexual excitement dependent upon the distention of the seminal vesicles and possibly of seminiferous tubules is dissipated by ejaculation, while excessive venery, by inducing irritation, retroactively evolves a constant, though weakened, desire.

We sometimes meet with those curious instances of periodic abortion, in which (ignoring for the moment structural defects, which prevent the uterus attaining more than a limited bulk) the patient, otherwise healthy, throws off the product of successive pregnancies at a uniform term,—only obviated by placing the pregnant woman in bed until past the fatal period.

These and other illustrations which might be educed show that our habits may be

evolved within us directly contrary to custom or to the influences supposed to be acting from without. There is, therefore, a part of the economy which, under proper training, can regulate and develop rhythmic effects.

The most marked physiological rhythm is found in the respiratory and cardiac cycle.

The respiratory centres are in the medulla at the level of gray matter of the fourth ventricle (the vital knot), placed on either side of the point of the calamus scriptorius, and connected by a gray commissure near the motor nerves of the tongue and lips, and cardiac filaments of the spinal and pneumogastric nerves, so that in labio-glosso-laryngeal paralysis the tongue is generally first affected, then the palate, then the orbicularis oris, followed by syncope and suffocation (Duchenne).

The centripetal paths of respiration are the pneumogastric and the numerous sensory nerves of the skin. The centrifugal, the motor nerves from the cervical and dorsal regions of the spinal cord to the diaphragm and the walls of the thorax. Cut the pneumogastrics, respiration will continue. Divide the spinal cord below the medulla, the facial and laryngeal movements will continue, the nostrils still dilate, the soft palate is swayed by the respiratory current, with a rhythmic widening and narrowing of the glottis. Moreover, the whole of the encephalon may be removed from above, and the spinal cord, as far as the origin of the phrenic cord, from below, without suspending the most essential of the respiratory centres. Now division of the cranial nerves in no way destroys respiration, but the destruction of these centres, as shown by experiment and in disease as above, causes its immediate cessation. Hence it is clear that the respiratory impulses proceeding from the respiratory centres are not simply reflex, but evidently start *de novo* from the centre itself. The centre is automatic and not simply reflex (Foster, Carpenter, Küss, Powers).

The heart of a frog, turtle, or fish will beat for hours, or under favorable circumstances for days, after removal from the body. The beat goes on even after the cavities have been cleared of blood. Küss states that the heart of an executed criminal continued its rhythmic contractions an hour after death.

There have been found in the heart itself three principal ganglia,—the ganglion of Remak, near the opening of the inferior vena cava; the ganglion of Ludwig, in the interauricular septum; the ganglion of Bidder, in the left auriculo-ventricular septum. The ganglion of Ludwig paralyzes, the others cause movements. The heart of the tortoise being cut into two pieces, in the one comprising the auricles and base of the ventricle rhythmic movements were found to continue, but not in the residue.

The rhythmic pulsatile movements of the heart are visible in the course of the second day of incubation in the fowl, and before any differentiation of tissue can be observed (Powers). The "rudiment of the mammalian heart, which is the earliest of the permanent organs of the embryo that comes into functional activity, consists of an aggregation of cells forming a thickening of the mesoblast beneath the anterior portion of the intestinal canal, and lying in the general pleuro-peritoneal cavity. . . . For a long time after it has distinctly commenced pulsating, and is obviously exerting a contractile force, its walls retain the cellular character, and only become muscular by a progressive histological transformation" (Carpenter).

Brown-Séquard found rhythmic movements of the diaphragm in rabbits after section of the phrenic nerve, and even after destruction of the entire spinal cord. He attributes them to minute ganglia, described by Rouget, on (terminal?) filaments of the phrenic nerve.

Peristaltic movements "may occur in a piece of intestine cut out from the body wholly independently of the central nervous system." "The only nervous elements which can be regarded as essential to their development are the ganglia of Auerbach, or those of Meissner in the intestinal walls" (Foster's "Physiology," p. 228).

Thus far we conclude—

That periodicity is a physiological quality inherent in the body, and existing as an original endowment in the healthy nervous system; that certain ganglia have been demonstrated as in themselves giving out rhythmic impulses, being alone able to evolve these *de novo*, and exercising this function "before any differentiation of tissue can be observed," and certain intrinsic actions, at first irregular, when repeated may become recurrent at stated hours through an educated reflex,—that is, by development of the central or ganglionic nervous system.

Intermittence is a peculiarity of many pathological conditions. Trousseau tells us "the intermittent or remittent type testifies to the existence of the nervous element. Diseases of nervous type often have periodicity, as epilepsy, catalepsy, chorea, many neuralgias, etc., these being manifestations of existing disease. Marsh fever is diathesic, like

gout, syphilis, etc., in that it tends to return at stated periods. Solar neuralgias occur in perfectly salubrious countries, where neuralgia comes on in the morning and goes off at night." A patient with "exophthalmic goitre every summer is seized with fever again or has a persistent cough, but auscultation detects no organic lesion of the lungs."

Professor Agnew, in discussing suppuration, says, "The pain is sometimes periodical, as in disease of the bones or joints, coming on in the evening and continuing for several hours;" and, again, "rigors in deep abscesses may return at regular periods with the uniformity of an intermittent."

Murchison, in an interesting sketch of intermitting or paroxysmal pyrexias and their differential characters (*Lancet*, May 3–10, 1879), enumerates twelve varieties:

1, Malarious ague; 2, enteric fever; 3, relapsing fever; 4, pyæmia; 5, pent-up pus; 6, ulcerative endocarditis; 7, tubercular fever; 8, lymphadenoma; 9, syphilitic fever; 10, urinary intermitting fever; 11, hepatic intermitting fever; 12, morphine habit.

A few of his cases are worthy of brief mention.

Thus, "In typhoid fever, for ten to fourteen days, a patient may present all the usual symptoms, . . . at the end of that time the attacks seem to abort; the pyrexia at first becomes more and more remittent, and then intermits. For a week longer the morning temperature may be normal, or possibly at length subnormal. . . . But in the afternoon, or towards evening, the temperature rises daily to 103°, 102°, 101°; the patient becomes flushed and restless, and often in the night may perspire profusely. . . . Should the patient be seen for the first time during this stage, his case might be mistaken for one of malarious ague."

Again, "I have repeatedly known cases looked upon and treated as malarious ague when the real cause of the intermittent fever has been pyæmia, and the error is all the more likely to be committed from the fact that large doses of quinine, although they will not arrest, will sometimes postpone the paroxysms of fever."

Again, "Fever in tuberculosis, many weeks before any local signs of tubercle can be discovered, . . . may be due to the deposit of tubercle in the lymphatic glands, to the development of an active process in obsolete caseous deposits or to deposit of miliary granules, which in no ways alter the normal physiological signs."

Again, "Syphilitic fever of intermittent type may occur,—1. In common with development of the eruption and *first* appearance of constitutional symptoms. 2. In common with syphilitic periostitis and rheumatism."

Again, "Passing a catheter may cause signs of nervous origin, but fever of intermittent type may be a result of stricture of the urethra, or from any cause of obstruction of the urinary passages, as enlarged prostate, calculus in ureter, the pressure of new growth upon the ureter. The fever may take an algid type, and may be due to absorption of some septic material produced in the decomposition of urine behind the seat of obstruction."

Again, "Patients with gallstones blocking the bile-ducts, the common hepatic or cystic ducts, are very liable to paroxysms of fever which simulate ague. Quinine seems to postpone the attacks."

Dr. Ord ("St. Thomas' Hospital Reports," vol. xi. p. 36): "A gentleman, æt. 30, who had never been in the tropics, suffered from daily attacks of high temperature, with shivering and sweating. . . . He was sallow, worn, emaciated, with some enlargement of liver, none of spleen, . . . with marked evidence of severe primary and a history of secondary syphilis. . . . Took quinine in large doses, and fever was much reduced, but only for a short time. 30 grains iodid. potass. daily was given, and after two days of this treatment temperature fell and the rigors ceased."

J. Wickham Legg ("St. Bartholomew's Hospital Reports," vol. x. p. 71): "Paroxysmal hæmaturia is a disease characterized by the sudden appearance in the urine of a certain amount of blood or of its chemical constituents, attended by general symptoms which closely resemble those of a fit of the ague."

Dr. J. H. Musser, of this city, in an instructive monograph on "Paroxysmal Fever now Malarial" ("Proceedings County Medical Society," 1884), reports a patient with such marked symptoms that empyema was suspected, and doubt only removed by paracentesis, proving the effusion was serous.

In another case the early formation of meningeal tubercle simulated malaria in its symptoms, and was treated as such, the true character of the disease only being discovered in the fourth week, seventy-two hours before death.

In another case primary cancer of the gall-bladder was thought to be malarial almost until death.

A patient who came under my care several

years ago had frequent, and at times somewhat profuse, hemorrhages from the bladder, attended by most alarming rigors, with heat and sweating. At times during the chill he would go into a state of collapse, so that it would seem as if he must succumb. There were some suprapubic tendencies. The case was a very obscure one, and a variety of opinions had been given the gentleman as to the cause of the symptoms, among which were hemorrhage from the kidney, possibly malignant, paroxysmal hæmaturia, hemorrhage from stricture of the urethra, etc. By a process of rigid exclusion I managed to locate the trouble in the bladder. Quinine seemed to do good, and washing out the bladder with a double catheter and a solution of boracic acid relieved the pain and vesical irritation, the urethra having been previously dilated to normal by metal bougies. The doubt as to diagnosis was removed in about a year, as, after a long watching, the patient passed with the urine masses which proved under the microscope to be polypoid. In the fall I went out of town for a couple of weeks, and the patient continued the washing out of the bladder himself, and found one day he brought away some of these masses in the eye of the catheter. He reintroduced it and withdrew others, and so continued from time to time till no more came, after which the bleeding stopped, the rigors ceased, and his health and body-weight were much improved. This is now some three years since, and only a few times, and that more especially of late, have there been traces of blood from the passage, with no reappearance of the other symptoms. I could multiply instances, but think we already have sufficient evidence to establish the assertion that intermittence is a concomitant of many diseased conditions.

I have endeavored to show that periodicity is a property of the healthy nervous system. It is therefore merely a healthy phenomenon reproduced in disease. We should not regard it as a symptom, but merely as an epiphenomenon.

We think this explanation far more rational than many other of the clumsy theories in vogue. Thus, Billroth declares, "The paroxysms of fever in pyæmia have a similar origin to those of ague, formed perhaps from decomposing pus being poured from time to time into the blood, *under favorable circumstances* exciting rigors and fevers."

Murchison asserts, "The fever paroxysms are due to propulsion by fits and starts of products of disease from the spleen."

Just as there is a fixed law as to time of birth, of puberty, cessation of menses, and of the cardiac and respiratory cycles, all of which are dependent upon the primary rhythmic endowment of the nervous system, so the action of the materies morbi will produce each its own series of symptoms, which may each or all of them be paroxysmal in their manifestation. Of the practical side of my subject I will only speak briefly, as I have already trespassed too far upon your time. We have too long considered chill, fever, sweat, or the recurrence of any one or all of these at regular intervals, as characteristic of ague. We were taught to *always* remember that malarial poisoning might be engrafted upon the onset of other distinct diseases. That malarial poisoning might induce the most grave and obscure symptoms.

I remember well Dr. Wood enforcing this by relating a case of epileptoid convulsions which he regarded as a result of malaria which was, indeed, cured by quinine.

Whilst not denying the virulent and insidious nature of paludal poison, I think we should regard the other side closely, that the rhythmic display may be produced otherwise than by this.

How many of our phthisical patients are treated as malarial, yes, even in the stage of cavity-formation, because the physician was misled by the regular recurrence of certain symptoms! One patient with hectic, loss of flesh, and rigors was declared to have phthisis, when he was suffering from syphilis, with suppuration of inguinal glands. The rigors and fever disappeared under the use of a bistoury.

I have purposely avoided the allied subjects of the mechanism of fever and chill, the rationale of motor impulse, or of peripheral irritation, and the differentiation of diseases, but allow me in closing to inculcate the maxim, Never say your patient has *malaria* or *ague* until you are *sure* he has *nothing else*.

It has been my privilege to endeavor to maintain,—

1. Periodicity is a physiological quality inherent in the healthy body, and more particularly in the ganglionic nervous system.

2. It is modified but not produced by influences external to the body.

3. Intermittence in disease is but a manifestation of a normal function under morbid excitation, and should not be considered a pathognomonic symptom of any class of diseases, much less of any special poison.

4. Intermittence is a symptom attendant upon many diseases.

5. By clearly recognizing the intra-nervous origin, subject, however, to irritation and excitation by extrinsic stimuli, we eliminate one of the most fruitful sources of serious error in diagnosis.

1523 GREEN STREET.

RECOVERY FROM FOUR-FIFTHS OF A GRAIN OF HYOSCINE.

BY W. H. H. GITHENS, M.D.

MISS L. S., about 45 years of age, dressmaker, light complexion, medium stature, and of fair physical development, sent for me November 28, 1885, on account of menstrual suppression; this was followed by ovarian neuralgia. Typhoid fever of a mild type gradually developed, and my visits continued through December, 1885, and up to the 12th of January, 1886, when I discharged myself, my patient being able to go out for a short walk. There had been a good bit of delirium through the fever, but the mind seemed to clear up entirely during the convalescence. There was not a perfect return to strength, and the disposition was not precisely what it had been before the fever. In March, 1886, I was called to see her again on account of sleeplessness, and prescribed hyoscine hydrobromate (Merck's), gr. i; alcohol, f℥i; aqua, f℥iv. M. Sig.—Four drops at bedtime for sleeplessness. Thus giving about $\frac{1}{75}$ grain at a dose. One or two doses usually accomplished the desired purpose. After a few days the insomnia passed away, and the bottle was put aside, less than a fluidrachm having been used. A few days later, while she was alone, she drank all that remained in the bottle, not less than four-fifths of a grain of hyoscine hydrobromate (granting that the prescription had been properly filled). Profound sleep was the only effect of this enormous dose. A neighboring physician was called in; he used towel-slappings and other forms of personal violence, and administered croton oil. I did not see the patient until the next day, when all effects of the hyoscine had passed away, so I can tell nothing of the state of the pupils or skin. The latter was bruised from the violence, and her mouth, tongue, pharynx, and stomach were in a terrible state of inflammation from the local action of the croton oil. I do not know why it was administered.

She committed suicide by hanging, July 27, 1886. Her mania took the form of fear of personal injury by men, the first objects of dread being workmen repairing the street-railway and men in a blacksmith-shop across the way. Removal to another house and mental occupation did not have any good effect: her room became peopled with the phantasms of her brain.

A FEW WORDS ON A CERTAIN KIND OF INSOMNIA.

BY F. EKLUND, M.D., STOCKHOLM, SWEDEN.

THE two most reliable signs of perfect health are, firstly, absence of pain; and, secondly, the ability of sleeping tranquilly and soundly.

But, unfortunately, the above state is comparatively rare, as the actual number of those who are victims of this most trying and serious affection—insomnia—is very great, and, moreover, is still on the increase.

As it would be beyond me to enter into a minute or exhaustive treatise on the subject, I must content myself with giving the reader a short account of a certain kind of insomnia which is most frequently met with, and which at the same time is most difficult to treat. I refer especially to the insomnia caused by malaria.

Guided by the experience of many years, I will, in as few words as possible, jot down the results of my observations concerning the different symptoms and forms of the malady. Serious mistakes may result if the cause of any insomnia be either mistaken or unknown.

First, we have a group of patients who sleep neither day nor night. It seems an utter impossibility for them to close their eyes or rest for a moment. All during the long night-watches they lie wide awake and count each stroke of the clock, and are painfully conscious of every sound. They are tortured by their own thoughts, and arise in the morning tired out instead of refreshed, scarcely able to get about, and almost entirely unfit to attend to their daily duties. During the day they sometimes feel overpowered by sleep, but when night comes again it is only a repetition of the previous one, and again the morning dawns without the patients having enjoyed a moment's sleep.

In another form of this complaint, when the patients have once awakened they find it

utterly impossible to get to sleep again, after, perhaps, a rest of only two or three hours at the very longest. Nevertheless, they will feel strengthened and refreshed by this short sleep sufficiently to be able to attend to their business, during which, however, they frequently break down, overcome by fatigue, their limbs seeming to give way under them.

To a third class of insomnia belong those patients who are able to sleep well upon retiring, but who always wake up at a certain time or moment. If it be on the hour, they will always start up out of their slumber while the clock is still striking, and after that there is no sleep for them for the rest of the night. When they awake they state that their short rest seems to have perfectly refreshed them, but they are usually subject to slight chills and fever and sweating, also to neuralgia and lumbago, and frequently to exhaustion.

It is most frequent upon careful examination of such patients to find that they for some time past have been suffering from intermittent fever, and are thus under the continued influence of malaria, and intermission is always more or less evident.

It is my intention to endeavor to give a natural and plausible explanation of the cause of this peculiar insomnia, and it will be hardly necessary for me to add that my conclusions are not based on hypothesis, but on practical experience.

It is a well-known fact that certain alkaloids, such as caffeine, theine, and theobromine, have the property of causing wakefulness.

It seems very probable to me that the microbes of malaria might produce a similar pathological action in many respects to that caused by the above-mentioned alkaloids. It is evident that these microbes are contained in great quantities in the veins, and also in the smaller vessels of the pia mater and the large ganglions of the brain. Here they may act as a most delicate "reagent," by means of which the existence of malaria may be proved, —viz., by their effect in producing insomnia of the patient.

Regarding the treatment of such malaria I have invariably obtained the best results by using quinine.

The treatment generally restores sleep to the patient in a very short time. The following is the formula I mostly use :

℞ Quin. sulph., .40 to 1 grm. (6 to 15 gr.);
Sod. bicarb., 1 to 2 grm. (15 to 30 gr.). M.
S.—F. tal. dos. No. xii. ad caps. amyl.

Take 1 powder or capsule every morning, and, if the case require it, 1 in the evening.

I found this formula to be most useful. I used the sodium bicarbonate because in most cases the patients were greatly troubled by symptoms of chronic gastric catarrh, which was relieved by its use. In some special cases I found quinine combined with dilute phosphoric acid to be of great value, in the following formula :

℞ Quin. sulph., 4 grm. (60 gr.);
Acid. phosphor. dilut., 5 grm. (75 gr.);
Syrup. zinzib., 30 grm.;
Aq. dest., 120 grm. M.
S.—A tablespoonful twice a day.

It will perhaps be unnecessary for me to state that I am bitterly opposed to the use of morphine, chloral, or any other narcotic or soporific in such cases. All my honored colleagues agree with me as to the danger of the use of such drugs in this affection. Instead of doing good, they augment and heighten the disease more than the microbes themselves do. In connection with this comes also an overwhelming sensation of excessive fatigue and mental depression, accompanied frequently by increased sexual desires and a morbid anxiety about business, etc.

I have furthermore found a hydropathic treatment to be of great service in the treatment of such insomnia, and usually administer a hip-bath twice daily. The temperature of the water should be from 28° to 32° C., and the patient should remain in the bath for two to four minutes. The water should cover the navel. It may be necessary for the patient to take a course of forty or fifty such baths during treatment. After the bath the body and limbs should be washed and then well rubbed. A bucket of cooler water (say 18° to 20° C.) may be poured over each shoulder, and later, after ten such baths have been taken, the patient should take a cold shower (10° to 15° C.) for about twenty seconds or a minute, and should then be well dried and rubbed. A massage treatment has also good effects.

In advanced stages of the malady friction should be used with a bath-towel dipped in tepid, fresh, or even cold water, as soon as the patient has gotten up.

As for my personal experience, I have spent many days and nights in the marshes; indeed, for the last eight years have lived and practised in a marshy country, and have found the above treatment to be most invaluable both in treating my patients and myself.

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Leading Articles.

CHRONIC LEAD-POISONING.

MOST of our readers are no doubt aware that some little time since Dr. J. J. Putnam, of Boston, called attention to the fact that in many cases of obscure diseases of the nervous system the symptoms are due to lead-poisoning, although there is no blue line upon the gums. In regard to the general correctness of these observations there seems to be little doubt. But we suppose few persons are prepared for the disclosures made in a recent paper by Dr. Putnam ("Transactions Association of American Physicians," 1887). In this paper there are reported eighty-six cases, in none of which were the classical symptoms of lead-poisoning, such as colic, marked cachexia, characteristic cerebral attacks or paralysis, or blue line on the gums, and yet in forty-eight of which lead was found in the urine. The various symptoms which were present in the cases in which lead was found are summed up by Professor Putnam as follows:

1. Paræsthesia of the hands and feet (two middle toes); twitching of the fingers; exaggeration of the knee-jerk, especially left.

2. General feebleness; paræsthesia in legs, with slight anæsthesia; twitching of muscles of legs; marked improvement under treatment; malarial history.

3. Spastic paraplegia; cramps and twitching of the calves; knee-jerk and ankle-clonus exaggerated.

4. Trembling of hands; sense of coldness and numbness of toes; lancinating pains in legs; fatigue on exertion.

5. Marked progressive spastic paraplegia, with myosis and pupillary reactions; ataxia, and some atrophy of hands.

6. Progressive weakness and stiffness in legs, with diffused and almost universal pains; marked tremor.

7. Temporary pain in chest, with slight dyspnœa; progressive numbness; heaviness and weakness in legs.

8. Numbness in feet and legs, with impairment of strength; tremor of hands and tongue; some wasting of small muscles of the hands; temporary retention of urine.

We are prepared by past experience to believe that multiple neuritis frequently is the result of obscure lead or arsenical poisoning, but confess to some reluctance in acknowledging that so many different forms of nervous and functional disorders are the outcome of one common cause.

The assertion of a chemist that he has found lead in the urine is not absolute proof that the lead really existed in the urine, nor is the existence of lead in the urine absolute proof that the symptoms of disease present in the case are the result of lead poisoning. This thought naturally leads to two questions: First, Is the method of analysis adopted in the cases of Professor Putnam reliable? Second, May lead be present in the urine of persons free from disease?

The method of analysis adopted by Professor E. S. Wood and his assistants is described by Dr. Putnam as follows (we understand from the context in the words of Professor Wood himself): "The urine is first evaporated to dryness, then fused in a crucible, with the addition of a little pure nitre, till it becomes white. The crucible is then cooled, and dilute HCl added, hot, to extract the residue after ignition. It is then filtered, and the filtrate treated with ammonia to alkaline reaction, to precipitate the phosphates and iron. Sulphide of ammonium is added at the same time, which throws down the sulphide of iron and lead. This is washed three times by decantation with hot water, then water is added, and the whole acidified with

HCl, and allowed to stand until the next day. It is then filtered through a small filter and the residue washed. A little pure (free from iron) nitric acid is then added, drop by drop, by which the sulphide of lead, if present, is dissolved and carried through as nitrate of lead. This is collected in a watch-glass, evaporated to dryness, and the final test made by the addition of a drop of water and a crystal of iodide of potassium."

In a matter like the present it is of the gravest importance that the method of analysis employed by the chemist be correct in all the principles and details. We therefore submitted the above statement to a chemist of authority for criticism. The first point to which he directed attention is that many crucibles contain lead in their glaze, which lead certainly would yield to a heated mixture of organic matter and pure nitre and form a soluble plumbite of lead. A large manufacturer of crucibles at Trenton informs us that many of the glazes contain as much as thirty per cent. of oxide of lead. That the glaze of all crucibles does not contain oxide of lead was established by our chemist by actual testing. Whether Professor Wood's crucibles contained lead or not remains at this distance an uncertain question. The second criticism is as to the meaning of the word "pure." When a "little pure"—*i.e.*, a little concentrated—nitric acid is added to sulphide of lead it does not, as stated in the text of Professor Putnam, dissolve all of the lead as a nitrate, but converts a portion of the sulphide into sulphate, which is insoluble and remains on the filter. There must be, therefore, if the method of Professor Wood be strictly followed out, a loss of lead at this point. Probably Professor Wood used nitric acid which is not concentrated, and which does not convert the sulphide into the sulphate, but the word *pure* ought to have been more definitely explained than it is in the text. A third very important point is the failure of Professor E. S. Wood to state, in the last line of the description of his method, whether he relied upon the formation of a yellowish color, or whether he actually got the crystalline plates of iodide of lead. If he relied upon the color his results are open to error, because if a little nitric acid had been left in the evaporation the yellow color would have been produced by the liberation of a minute quantity of iodine. Or, again, the yellow coloration may have been produced by the action of the potassium iodide upon a trace of copper, which latter may have got into the solution from the use, or even the contiguity, of brass or copper utensils during the course of the analysis. This is of very frequent occurrence in laboratory operations, and is often due to minute particles of cupric oxide carried by currents of heated air and falling into the material under examination. So, again, the hydrochloric acid may not have completely dissolved the iron from the precipitate of the sulphides of lead and iron, and the result of the final test with potassium iodide (if simply a coloration) may have been due to the presence of iron. In order to avoid these fallacies, the final residue should at least have been tested for copper and iron. Finally, a serious possible source of error in the analysis of urine made according to Professor Wood's method is, that if the urine contain any bismuth it would yield not only the yellow color in the final test, but also a precipitate of yellow crystalline plates scarcely distinguishable by the eye from those of iodide of lead.

In regard to the possible contamination of lead in the bottles in which the urine was collected, Professor Putnam probably secured himself against it sufficiently by acidifying the urine, although, strangely enough, he is in error in the belief that flint-glass, out of which his bottles were made, is free from lead. Flint-glass is lead-glass.

The second question was asked a few paragraphs back as to how far lead may be tolerated in the system of human beings without causing disease. There seem to us only two methods which offer any hope of arriving at the solution of this problem. The first of these methods consists in the making of numerous examinations of the urine of persons who are entirely healthy. If lead be found to be habitually present in the urine of even a small proportion of apparently healthy persons, its presence in any given urine loses much of its significance and we must concede that a very considerable amount of lead must be accumulated in the system in order for it to act as a distinctly toxic agent. Unfortunately, in the series of analyses made at Harvard the urine was examined chiefly of persons more or less out of health, and therefore we are unable to draw any distinct conclusions as to the tolerance of lead by the human system, although Professor Putnam records having found it in the urine of three absolutely healthy individuals. We sincerely hope that some one will undertake a series of analyses looking for lead in urine during health. The second method of testing the relation between

lead in the urine and symptoms is the therapeutic one: if in such cases the symptoms disappear under the administration of iodide of potassium and the other usual treatment of lead-poisoning, it is fairly made out that the symptoms are due to the lead. Failure of improvement, on the other hand, does not prove the lack of connection between the metal and the symptoms, because the metal may already have produced serious organic disease which is irreparable, although the metal itself be entirely removed from the body.

STROPHANTHUS.

THIS new African heart-drug continues to attract attention both abroad and in this country, and the evidence seems to be sufficient to show that it has great practical value.

Professor Drasche (*Wien. Med. Blätter*, 1887, page 586) found 5 drops of the tincture of strophanthus given to the healthy man would produce in about three hours a fall of from about 8 to 12 beats per minute of the pulse, which would last part of the day. After 10 drops the pulse fell in half an hour 12 to 20 beats; after 20 drops the pulse sank in the single case given from 84 to 54 strokes. There was no influence on the respiration, but a lowering of the temperature, in some cases as much as a degree. Fifteen drops given hypodermically caused great irritation and pain and swelling at the place of injection, violent headache, repeated vomiting and nausea, and copious secretion of urine: the pulse fell in an hour from 96 to 84, and the next day the headache and general ill feeling continued, with a very pronounced local irritation. In a strong forty-five-year-old man suffering from left-sided pneumonia, four doses a day of 5 drops of tincture of strophanthus was followed in twenty-four hours by a fall of the pulse 18 beats per minute, and by a distinct slowing of the respiration and reduction of the temperature 0.8° C. The pneumonia itself was not affected, and the crisis came on the ninth day. In another similar case, under the influence of the strophanthus, the pulse fell from 128 to 88 beats. In acute phthisis the remedy acted very promptly: there was high fever, and the pulse ranging from 140 to 152; five minutes after the exhibition of 10 drops the pulse fell 20 beats, and two hours later 40 beats, whilst the temperature had gone down between one and two degrees, and the distressing cardiac palpitation was relieved. The rapidity of the action of strophanthus showed itself also in a case of gastro-duodenal icterus. In twenty minutes after the use of 20 drops the pulse had fallen from 72 to 60, and the blood-pressure, as measured in a temporal artery, had increased ten per cent. According to Professor Drasche, 40 to 50 drops a day must be considered as the maximum dose of the tincture. Under 60 drops a day, in an experimental case, the pulse became exceedingly small, weak, and irregular. In a case of vaso-motor neurasthenia, with great rapidity of the pulse, the continued use of the medicine was kept up, with interruptions, until six hundred drops of the tincture had been taken, without the production of any evidences of cumulative action. Professor Drasche has also used the remedy in a number of cases of heart-disease. In one case of a thirty-six-year-old patient with fatty heart and very pronounced cardiac symptoms, 10 drops of strophanthus tincture produced great relief of palpitations and of the dyspnœa. One hundred and sixty drops were taken in the course of five days without the slightest evil influence. In a second very advanced case, in which there was dropsy, very pronounced dyspnœa, and very irregular pulse (120), and in which digitalis had failed, 5 drops of the tincture every two hours, until thirty drops had been taken, caused the pulse to fall to 108 without becoming more regular, but shortly afterwards the patient fell into a stupor, and four days later died. In another similar case, forty drops of the tincture a day was followed by marked fall of the pulse and increase of the urine. Strophanthin was later given in solution, the four doses each day amounting to two milligrammes. The pulse became very irregular, varying from 36 to 60 beats every minute. There was marked increase in urinary secretion and great lessening of the dyspnœa. In a case of aortic insufficiency, which came into the hospital almost moribund, with the pulse 96, scarcely to be felt, 15 drops in an hour caused the pulse to fall to 72 and become much stronger, and the patient slept through the night, for the first time in three months. Afterwards 40 drops of strophanthus tincture being given daily, the pulse fell to 60; but the patient complained of so much burning in the œsophagus and stomach and nausea that the medicine was withdrawn and digitalis substituted. It, however, failed to have influence, and the man shortly afterwards died suddenly. In a second case of

aortic insufficiency, the tincture of strophanthus was given for four weeks regularly, 40 drops a day, with great relief to the dyspnœa. Besides these cases, Dr. Drasche reports several others in which the strophanthus tincture produced results similar to those that have been just described. The effect upon the excretion of urine seems to have been most extraordinary. In some instances the amount excreted after the administration of the drug was five, or even six, times what it had been before. Almost universally when the strophanthus was pushed the patient complained of burning in the œsophagus and stomach, with loss of appetite and extreme gastric distress, which not rarely rose to vomiting; sometimes there was diarrhœa. In no case was there any evidence whatever of cumulative action. The action of the drug is not only more prompt in coming on, but is evidently less permanent than is that of digitalis. Dr. Drasche also tried using the remedy in cases of mitral insufficiency; here the effect of the remedy was often more marked than in cases of aortic disease. In one old case, with bloody sputum and other very severe symptoms, 25 drops a day of the strophanthus tincture had so favorable a result that on the eighth day the patient left the hospital. In a case of mitral stenosis, with very severe symptoms and great cyanosis, after a second dose of 45 drops of the tincture the pulse fell from 88 to 44 per minute and the respiration from 36 to 18, the dyspnœa disappeared, and the heart's action became not only stronger but less irregular. Under the continued use of the remedy the pulse became strong, at the rate of 44 beats, the respiration 16, and the urine enormously increased. This patient took in all three hundred and sixty drops of the tincture without any untoward symptoms, but with the most favorable results, the patient leaving the hospital greatly relieved. Other cases of mitral disease were affected similarly. As the result of his observations, Professor Drasche thinks that whilst we must consider digitalis to act more as a tonic agent upon the heart, strophanthus must be looked upon rather as a cardiac stimulant. He is also particular in cautioning a physician to see that the preparation used is genuine and pure. Strophanthin he believes to fully represent the tincture. As a diuretic, he gives the daily dose of strophanthin as 3 milligrammes, and, for reasons which we have already laid before our readers, condemns its use hypodermically.

Mr. Zerner and Loew (*Wien. Med. Wochenschr.*, Nos. 36 to 40, 1887) have recorded the results obtained in the service of Professor Bamberger, of Vienna, in using strophanthus in cardiac affections. They affirm that it is equal in efficacy to digitalis, and that they have only seen it fail when the degeneration of the heart-muscle has gone to the last degree. The indications and contra-indications for its use, they think, are identical with those controlling the employment of digitalis. In one mild case of Basedow's disease, the pulse, which, at the moment of administration, was 100, half an hour later had fallen to 88; half an hour after this it was 84, but four hours later it had regained its original frequency. In seven out of eleven cases of Bright's disease they achieved very good results from its administration. It is especially indicated when there are evidences of secondary failure of the heart in renal disease. In several healthy subjects no diuretic action at all followed the use of strophanthus. This, if it be confirmed, proves that the diuretic action of the drug in disease is dependent not upon any influence upon the secreting structure of the kidney, but is the result of the increased blood-supply to the organ. Zerner and Loew also confirm the statements of Drasche that in large doses the remedy produces nausea and vomiting.

Dr. William Budd reports in the *Lancet*, September 10, 1887, two cases of mitral cardiac disease, with albuminuria, and excessive and other very severe symptoms, in which strophanthus was entirely successful after the failure of digitalis. The effect of the drug upon the secretion of the urine was extraordinary. He used 5 minims of the tincture three times a day.

A new use for this remedy, which more than its properties as a cardiac tonic will serve to render it popular, is its employment as a diuretic in renal colic. Dr. Hutchinson reports, in the *Provincial Medical Journal*, October 1, 1887, a case of marked uric acid diathesis occurring in a man aged 52, who, since twenty years of age, had been subject to periodical attacks of gravel. When Dr. Hutchinson was called to see the case, the patient was then suffering from a violent attack of colic from the passage of a calculus through the ureter. There were severe lumbar pains, scanty urine, and difficulty in micturition. At the onset of the attack the urine was high-colored, and then smoky, and finally contained blood. The bowels were confined; there was no nausea, but total

anorexia. Dr. Hutchinson ordered him turpentine stupes across the loins, plenty of fluid to drink, a seidlitz powder in the morning, and tincture of strophanthus in 5-minim doses three times a day. The result of this treatment was to produce copious diuresis and a rapid relief of the pain.

In the absence of any officinal standard, the tincture of strophanthus, as sold in various drug-stores, must vary in strength, and the important question as to the proper dose to be employed must remain unsettled. The only recourse that the practitioner has, who does not know exactly the method in which the tincture that he is using has been prepared, is to commence with a minimum dose, and increase until the effects are obtained. The tincture should be prepared according to the method of Professor Fraser, as given in the first volume of the *British Medical Journal* for this year. The dose of this tincture may be set down as 5 drops, carefully increased, if necessary.

DIURETIC ACTION OF CAFFEIN.

IN poisoning by caffein there is usually great increase in the secretion of urine, and the statement of Professor Gublin (*Bull. Thérap.*, xci. 523), that the citrate of caffein is one of our most powerful and certain diuretics, has received abundant confirmation. The effect of the drug upon healthy men would indicate that in dropsies it acts not simply by regulating the circulation of the kidney, but has also a distinct effect upon the renal organ itself. That this surmise is correct is proved by the experiments of W. V. Schröder and A. Langgard (*Centralbl. Med. Wissen.*, 1886), who found that when canulas were inserted into the ureters in an animal whose vaso-motor system was completely paralyzed by chloral, injections of caffein into the circulation caused a very great increase in the urinary secretion. Langgard found that usually before the great increase of diuresis the urinary secretion was arrested for several minutes. This is in exact accord with the experiments of Dr. C. D. T. Phillips (International Medical Congress, Washington, 1887), made with Roy's oncograph. Dr. Phillips found that immediately after the injection of a small dose of caffein, when the blood-pressure was either slightly depressed, elevated, or unaffected, the kidney underwent a very distinct contraction of its volume, which lasted for two, or even three, minutes, and was accompanied with arrest of the urinary secretion. After the contraction the kidney rapidly expanded beyond its original bulk, and at the same time the urinary secretion became excessive. These various experiments prove that the action of caffein upon the renal secretion is entirely independent of its influence upon the general circulation. The fact discovered by Dr. Phillips does not show, however, that the diuresis is caused by the increase in the flow of the blood to the kidneys. It is much more probable that the condition of the local blood-vessels is the result of the action of the drug upon the renal secreting tissue; especially is this the case, since Schröder found that the division of all the renal nerves did not prevent the increase of the secretion under the action of caffein. Because the secretion from the uninjured kidney was increased much more than from the kidney whose nerves were destroyed, Professor Schröder believes that the drug increases diuresis by acting both upon the nerve-centres and the secreting structure of the kidney. To our thinking, however, the direct injury to the secreting apparatus of the kidney by division of the renal nerves is sufficient to account for the difference between the influence of the alkaloid upon the normal and the operated-upon kidney, without necessitating a belief of the possession by the alkaloid of a twofold influence. Professor Schröder found that there was an increase not only of the liquid, but also of the solid of the urine.

EPHEDRINE, A NEW MYDRIATIC.

PROFESSOR NAGAI has extracted from the *Ephedra vulgaris* Rich., by a process whose details he promises to publish subsequently, an alkaloid to which he has given the name of ephedrine. M. Kinnossuke Miura has published a preliminary note on the action of this drug in the *Berliner Klin. Wochenschrift*, No. 38, 1887, p. 707. He has found that in the frog a toxic dose (of about 8 to 10 milligrammes) of the chlorhydrate of ephedrine produced progressive slowing, and finally arrest of the respiratory movements, without any stage of acceleration. The frequence of the cardiac rate is influenced in the same manner, and the heart is finally arrested in diastole, and the pupil is dilated. These results follow the introduction of the alkaloid in the pericardium or in the lymphatic sacs. In the mammal both

respiration and pulse are considerably accelerated, and finally are entirely arrested, without any previous slowing; at the same time clonic convulsions occur, and the temperature in the rectum becomes elevated. The intravascular blood-pressure is diminished, and then rises above normal during the stage of convulsions, but finally becomes reduced as they pass off. The pupils are dilated whether the poison be injected subcutaneously or instilled in the conjunctival sac. Death is produced by the arrest of the heart and respiration. A lethal dose is .03 to .4 grm. per kilogramme of body-weight in the rabbit, and .22 grm. per kilogramme of body-weight in the dog. In addition to these notes as to the physiological action of the drug the author likewise, under the direction and in the clinic of Professor Scriba, at Berlin, carried out a series of clinical experiments, testing the value of seven and ten per cent. solutions of ephedrine as a mydriatic in normal and diseased eyes. Solutions of six and seven per cent. have proved themselves unreliable in producing dilatation of the pupil, it occurring in some subjects after ten or fifteen minutes from the instillation, while in others it has not appeared. With ten per cent. solutions the author found that the pupils were dilated in from forty to sixty minutes after an instillation of one or two drops, this dilatation being equal on the two sides when no inflammation was present, and when the refracting power of the two eyes was the same. The dilatation of the pupil produced by this drug is not complete, but it was sufficient to permit ready exploration of the retina in all its extent, even although the entrance of the ray of light into the eye caused each time a slight pupillary reaction. Children and aged persons were found more sensitive to the mydriatic action of ephedrine than adults. The accommodation was not paralyzed at all, or at most but slightly. When the iris was in a state of irritation or inflammation, but little dilatation of the pupil was produced by this alkaloid. In normal eyes the dilatation from the time of instillation to the time of the return of the pupil to its normal diameter varied in duration from five to twenty hours. After two weeks of three instillations daily of a ten per cent. solution no conjunctivitis or no disadvantageous result was detectable, and no increase or diminution of the intraocular pressure. Comparative experiments made with solutions of homatropine have demonstrated that following instillations of this mydriatic six to nine hours are required for the pupil to return to its normal diameter. It would appear from these facts that the chlorhydrate of ephedrine is a convenient mydriatic, which may be substituted for homatropine for the examination of the ocular fundus: it is distinguished from the latter by the facility with which it is prepared, and by the harmlessness of its employment, even although a solution ten times more concentrated must be employed. In addition, its employment is not complicated by any ill effects, and the accommodation is so slightly paralyzed as to cause no inconvenient results to the patient. We will await with interest Professor Nagai's promised communication as to the mode of preparation and chemical constitution of this substance, and for further details as to its clinical employment.

AMYLENE HYDRATE, THE NEW HYPNOTIC.

OUR readers are familiar with the studies of Professor von Mering with amylene hydrate, or tertiary amyl alcohol. At his suggestion this substance has been extensively tested in the clinic of Professor Jolly. Comparing the effects with other hypnotics, such as chloral, paraldehyde, and urethan, the results seem extremely favorable. As reported by Dr. Scharschmidt, in the *Therapeutische Monatshefte* for September, 1887, the drug was administered to eighty patients in one thousand and fifty different doses, given in brandy, with a small amount of syrup of orange-peel to disguise its taste. It was found, however, that this mode of administration was not satisfactory, since the addition of the syrup caused a variable precipitation of the amylene hydrate. The best mode of administration was found to be in combining the amylene hydrate with red wine, and a small amount of sugar added to it. Apparently an equally effective method of administering it is with a small amount of extract of liquorice, which completely disguises the taste of this substance when dissolved in water. The doses in which it was employed in Professor Jolly's clinic varied from 22 to 75 grains, the latter quantity being only once given. The average dose consisted of 45 to 60 grains. Dr. Scharschmidt tabulates the cases in which this drug was employed, from which it appears that in eighty per cent. of his cases sound sleep, of from five to seven hours' duration, was produced with doses varying from

20 to 45 grains. In comparing this with chloral and paraldehyde, its superiority would appear to be very striking, since only in about seventy per cent. of the cases where chloral was used, or seventy-six per cent. in the case of paraldehyde, was the result successful. In the experiments with amylene hydrate no absolute failure was noted in any case, since sleep was always produced either by the continued use of the original dose, or by gradually increasing the quantity. It is noticeable from this that the writer has obtained even more successful results than Von Mering, since Dr. Scharschmidt finds that in general 22 grains of amylene hydrate were equivalent to 75 grains of paraldehyde, and that the action of 15 to 25 grains of chloral was always less favorable than the results which followed the administration of from 35 to 50 grains of amylene hydrate. Absorption of this new hypnotic by the alimentary canal and by the stomach or the rectum occurs with great rapidity, since in many cases sleep occurred within five or ten minutes after the administration of the remedy. In excited or restless cases twenty or thirty minutes were required for the production of sleep, and in maniacal cases from one-half to one hour. No disagreeable after-effects were noted, no disturbance of the appetite or in the action of the bowels, and but rarely slight headache on the following day. Of special importance is the fact that the statement of Von Mering is confirmed, that amylene hydrate produced no modification of the respiratory or circulatory organs. The rhythm and number of the respiratory movements are not to be distinguished from those of normal sleep. No change in the number of the pulsations or in the pulse-curve, as examined by the sphygmograph, were detected after the administration of the amylene hydrate; in some cases a slight increase and in others a slight decrease in the pulse-frequency being scarcely worthy of notice, and presenting no greater variety than might be expected between the sleeping and the waking states. As yet no positive statement can be made as to whether patients become accustomed to this hypnotic and its effects gradually wear off, but it would seem that its having been used constantly with success in two cases for thirty-nine days would warrant a negative answer. Of the eighty cases in which this drug was employed, twelve consisted of melancholia with stupor, five of melancholia agitata, thirteen of dementia paralytica, one of epilepsy with alcoholic dementia, four of primary dementia, seven of hallucinatory insanity, one of hypochondriacal insanity, one of stupor, one of chronic alcoholism with insomnia, ten of mania, two of delirium, four of delirium acutum, six of delirium tremens, one of hysteria with insomnia and delirium, one of epilepsy with excitement and delirium. It would appear from these results that the tertiary amyl alcohol has proved itself to be a reliable hypnotic, since it can be employed in heart-affections, and is without influence on the alimentary canal. It is superior to urethan, since it produces sleep even in states of the wildest excitement, and is at any rate equally as good as paraldehyde in efficiency, and is free from the disagreeable odor and taste of the latter.

METHYLENE CHLORIDE AS AN ANÆSTHETIC.

SINCE the introduction of chloroform into medical practice as an anæsthetic there has been a constant effort to discover some other anæsthetic which, possessing the advantages, would be free from the dangers of chloroform. The theory that in the various chlorine compounds the danger is in direct proportion to the percentage of chlorine has obtained much support, and it would therefore appear warrantable that methylene chloride (CH_2CL_2) would be less dangerous than chloroform ($CHCL_3$). In spite, however, of this theoretical advantage possessed by methylene chloride, it has not been able to displace chloroform, perhaps from the less degree of anæsthetic power possessed by the former. Our readers are already familiar with the recent experiments of Richardson, who, in 1867, first called attention to this substance as an anæsthetic, and with the fact that in spite of the favorable claims advanced by Richardson, with other writers, such as Spencer Wells, the value of this drug is almost universally denied. Dr. Eichholz and Professor Geuther, in a paper published in the *Deutsche Medizinal Zeitung*, August 22, 1887, attributed this doubt as to the value of methylene chloride as a narcotic to the fact that methylene chloride of commerce is not by any means pure methylene chloride, but that the English preparation is a mixture of one part of methylene alcohol and three and four-fifths parts of chloroform, and that the German preparations consist of one part of methylene chloride and four parts of chloroform. This impurity is further testified by the fact that one hundred grammes of

commercial methylene chloride only cost three and a half marks, while one hundred grammes of the chemically pure methylene cost about twenty-five marks. Recently, however, by an improved process of manufacture, pure methylene chloride has been placed on the market at a greatly reduced price. From an elaborate series of experiments Eichholz and Geuther concluded that, whether in its pure condition or mixed with chloroform, methylene chloride possesses great advantages as an anæsthetic, and the authors make the claim that until now the pure article has never been tested as an anæsthetic on man. This is in accord with studies made in the laboratories of the Medical Department of the University of Pennsylvania.

Their experiments in comparing the action of chloroform and pure methylene chloride may be stated in few words, as follows: First, narcosis occurs with both remedies after about the same time. Second, with both drugs there is a preliminary period of excitement. Third, with methylene chloride there is no increase of pulse in the period of excitement; there is in the course of chloroform. Fourth, in both cases after the occurrence of the narcosis there is slowing of the pulse and respiration, though these symptoms occur sooner and to a greater degree in the chloroform narcosis, and the complete arrest of the pulse and respiration occurred much sooner in the case of chloroform than with methylene chloride. The reduction of temperature in narcosis is with both about the same. Methylene chloride produced salivation; chloroform does not; methylene chloride produced transient narrowing of the pupil. In methylene-chloride narcosis the rigidity of the neck is more marked than in the case of chloroform, but convulsions of the limbs are more frequently seen with chloroform than with methylene chloride. With these points of similarity, the only advantage which might be attributed to the methylene chloride is its very much less dangerous action on the heart. For while in chloroform narcosis after the administration of only five cubic centimetres the heart-action is often imperceptible, the authors claim that they have frequently produced profound methylene-chloride narcosis for nearly an hour without ever producing any unfavorable action on the heart. They also state that even when the pulse becomes arrested by the methylene chloride the animals are much more readily and rapidly resuscitated through artificial respiration. In comparing the narcosis produced by pure methylene chloride and mixtures of alcohol and chloroform, it was found that the addition of methyl alcohol to chloroform somewhat reduced the poisonousness of the latter without reducing its narcotic action, and therefore is to be preferred to pure chloroform as an anæsthetic. The mixture which they recommend consists of forty-five parts of chloroform to thirteen of methyl alcohol. They conclude their paper with the following sentences: First, that the substance heretofore employed as methylene chloride is a mixture of chloroform and methyl alcohol; second, this mixture is to be preferred to chloroform for the production of narcosis; third, that pure methylene chloride produces narcosis quite as rapidly and as profound as either of the above preparations; fourth, that the action of pure methylene chloride on the circulation and respiration is, by far, less dangerous than that of either of the other preparations.

GLEDITSCHINE.

IN a letter to the *Medical Record* of November 5 the genuineness of gleditschine is reasserted, and a proposition is made by Mr. Goodman, through Dr. Claiborne, to submit the leaves supposed to come from the *Gleditschia triacanthiæ* to a committee composed of medical men, a chemist, and a botanist, who are to determine, first, whether the leaves are really those of the tree which they have been supposed to represent; second, whether they contain any alkaloid; and third, if an alkaloid be found, whether it is an anæsthetic. We understand that Drs. George F. Shrady and F. P. Foster have agreed to serve upon the committee. Is it possible that there is an alkaloid gleditschine, which has really been obtained by Goodman, and that the intermediate druggists have, finding the demand greater than the supply, put upon the market a solution of cocaine under the name of gleditschine?

THE TREATMENT OF GOITRE BY SUBCUTANEOUS INJECTIONS OF ERGOTIN.

A CORRESPONDENT writes us inquiring the exact technique in the treatment of goitre by hypodermic injections of ergotin. In this he gives us an almost impossible task. It is but a short time since this method of treatment was introduced by Coghill, and the discrepancy between the few writers who have published communications on this sub-

ject is so great as to render it impossible to fix the exact status of this mode of treatment. Bauvens, writing in the *Journale de Médecine* for September, 1887, seems to have had remarkable success. His first procedure was to inject 16 minims of a solution containing one part of ergotin to seven of glycerin and seven of water. This proving unsuccessful, he then injected the same quantity of the solution of three parts of ergotin to seven of glycerin and water, and this proving somewhat efficacious, the strength of the solution was then increased to five parts of ergotin to seven of glycerin and seven of water, and in a period of two weeks four injections of 16 minims, which were administered. These injections were somewhat painful, and caused slight inflammation and swelling, but after three weeks both inflammation and goitre were claimed by Bauvens to have completely disappeared. He claims that the injection should not only be subcutaneous, but should be carried into the parenchyma of the gland.

Our own opinion is that the irritation produced by ergotin injections is so excessive as to render it almost unfit for hypodermic use. It is nearly generally acknowledged from experience in gynæcological practice that the injections into the skin of the abdomen must be given up, and that the nates alone are fitted for such irritating injections, a fact already proved by the syphilologists for corrosive sublimate and calomel. On the other hand, great difficulty attends the selection of the most suitable solution, for as long as we are ignorant of the active principle of ergot, we can naturally not expect to get a constant preparation of its active principles. As a rule, the greatest reliance may be placed upon the watery extract of ergot. But this also causes troublesome local symptoms even when injected into the nates. A considerable part of the burning pain which follows the use of preparations of ergot is dependent upon their acid reaction. It has been found by Bumm (*Centralblatt für Gynäkologie*, August 28, 1887) that the ergot preparation might be neutralized by a slight addition of soda without interfering with its efficiency, but that the preparation cannot be kept in an alkaline condition on account of its tendency to undergo rapid decomposition. Another source of irritation lies in the concentration of the solution, since the objection to the larger quantity of fluid is not as serious as the local pain and inflammation caused by more concentrated preparations. Weak solutions are, besides, more rapidly absorbed than stronger solutions, and it may be said that if five, or at most ten, per cent. of the watery extract twice purified, neutralized with soda and filtered, is injected into the muscles of the nates, the local irritation produced is not worth mentioning. As to whether a similar state of affairs holds for injections into the thyroid, or as to whether injections of ergotin offer better hopes of cure than enucleation, must as yet remain undecided.

Reports on Therapeutic Progress.

THE USES OF SACCHARIN.

Saccharin must be regarded from a twofold aspect in its therapeutical effects and uses: first, antiseptic; and, second, sweetening. It is asserted by competent authorities—Aducco, Mosso, Stutzer, and Stadelman—that it approaches in energy such antiseptics as salicylic acid and thymol. On the other hand, it does not arrest or interfere with the normal fermentative action of the animal secretions in the stomach or intestine. It is without any action on ptyalin or pepsin. Nor does it appear to have any secondary action on the digestive secretions, passing quite unchanged out of the system through the kidney in the urine, in which latter it may be found within half an hour from its ingestion. The result is no different if it be injected subcutaneously or into the intestinal tract. It is not even found in the mammary secretions in either case. Yet so readily is it absorbed and eliminated that even when as much as seventy-five grains were taken daily no trace could be found in the system in twenty-four hours. Professor Leyden and other physicians—notably Drs. Salkowsky and Stadelman, who have used saccharin continuously in hospital practice both as a medicine and for dietetic purposes—state that even when taken in quantities far larger than are required for ordinary sweetening purposes with food, and over a long period of time, there were not the least injurious effects. So reliable are the reports on the use of saccharin in Germany that the authorities have authorized the completion of large contracts for the supply of tablets to the army. Thus it would appear that in saccharin we have an agent which is absolutely harmless in its passage through the system, eliminated from it unchanged without any deleterious effects, transitory or other, on the genito-urinary system, with sweetening properties three hundred times as strong as cane-

sugar, and free from the injurious results which, under certain conditions, follow from the decomposition of a carbo-hydrate in the system. How far, under what conditions, and in what secretions its special antiseptic properties may be utilized experience may determine, but even the simple fact that a pleasant antiseptic, harmless in operation on the tissues, can be passed through the body in a short time is one of both considerable moment and interest. That its antiseptic properties are manifested as an antifermentative agent in the urine has been proved by the researches of Mosso and Stadelman. It does not appear that this fermentative retarding influence of saccharin, from which we might have expected so much in cases of chronic cystitis, has as yet been shown to act curatively in this affection. But there are numbers of cases of rapidly-decomposing alkaline urine in which early fermentative changes promote the decomposition, when, it is only reasonable to argue, it would have a retarding and therefore beneficial action.

It is as yet rather a matter of surmise how we may apply the properties of saccharin in the treatment of various affections. In the *Medical Press* for October 12, 1887, Dr. H. Macnaughton Jones gives a number of indications for the therapeutic employment of this drug which are worthy of attention. So far, we naturally recur at once to true diabetes and those transient glycosuric states in which there are distinctly fermentative tendencies in the blood, as, for example, in epidemic furunculus and anthrax, and as we find frequently proved by the boils or carbuncles of diabetes mellitus. Careful experiments have shown that saccharin in solution greatly retards the fermentative progress of torulæ, and it would also be interesting to know what special influences on schzo-phytes or microbacteria solutions of saccharin possess. It has long been the desire of the physician to be able to administer in such acute infective diseases as smallpox and typhus fever antiseptic and antifermentative remedies which would not nauseate and might be palatable or capable of being disguised, and which in combination with antipyretic medicines would not interfere with the action or administration of these latter. It seems that, if we cannot yet assert that we have arrived at this much-desired object in this instance of saccharin, at least its discovery has shown that the acquisition of such an antiseptic as that referred to is possible. In the diluents, mannite, sugar of milk, and gluten, we have three most useful means of administering saccharin therapeutically or dietetically in solid form. The tablets before alluded to are composed of saccharin, carbonate of sodium, with or without some other medium, as mannite. Powders ready prepared with the same diluents of various strengths may be had. Half of one of these pellets will be quite sufficient for the small cup of tea or coffee.

In gout, the necessary dietary may be made more bearable by the employment of saccharin ; so, also, in the bladder-affections of old age and in biliousness it may be employed with advantage. In many cases of gastric catarrh, skin-affections, eczematic skin-affections in children, where saccharin food is counter-indicated, saccharin may be availed of for sweetening food and disguising the taste of medicines. In addition to these uses of saccharin, its value in pharmaceutical practice promises to be very marked. The mixture of six drachms of tincture of chloride of iron, two drachms of four per cent. solution of spirit of saccharin, renders this valuable preparation quite agreeable to the taste ; so, also, equal parts of saccharin and fluid extract of cascara sagrada disguises the taste of this valuable aperient. Thirty grains of salicylate of sodium, with thirty drops of spirits of saccharin, in seven drachms of water, becomes quite palatable ; so, also, the unpleasant but useful chloride of ammonium lozenges may through its use be rendered more agreeable. Saccharin might likewise be substituted for the sugar in a compound powder of liquorice, where the large amount of the sugar now present is against its frequent use as an aperient. The iodide of iron is, like the muriate, well disguised, and is a more permanent preparation when made up with saccharin than the present syrup.

In this connection the following notes as to the chemical properties of saccharin, published by Mr. A. D. Gravill in the *Pharmaceutical Journal and Transactions*, are of interest. Saccharin now occurs as a very pale yellow, nearly white, amorphous powder, free from grittiness, but giving a distinct sensation of roughness when rubbed between the fingers. It is not entirely free from odor, but this is very slight and not at all objectionable, reminding one of a very slight flavor of essential oil of almonds. Its taste is intensely sweet and persistent, which in the raw state is followed by a slight harshness upon the tongue and palate. The sweetness is very distinct when diluted to 1 in 10,000. Under the microscope it presents no definite form of crys-

tallization. A temperature of 100° C., even if continued for some time, has no perceptible effect upon saccharin; it loses no weight, and undergoes no physical change. It fuses at a temperature of from 118° to 120° C., and at 150° C. forms a clear light yellow liquid, which boils a few degrees higher. At the latter temperature dense white fumes appear, and a condensation of tufts of acicular crystals (some well defined) is found upon the cool surface of the apparatus. These crystals, except for a slight sweetness of taste, correspond in characters and tests to benzoic acid. The sweet flavor may be due to the presence of a very small quantity of undecomposed saccharin, carried mechanically with the fumes. The escaping vapors, which are very irritable, and give a more decided odor of hydride of benzole than the powder itself, also communicate a very distinct sensation of sweetness to the back part of the palate. Heated over a flame, with free access of air, saccharin carbonizes and burns with a dull, yellow, smoky flame, leaving a residue amounting to 0.65 per cent. of sodium salts. It does not reduce an alkaline copper solution, but, like glycerin, liberates boracic acid from borax, the latter salt dissolving saccharin readily in aqueous solutions, due, no doubt, to a displacement of the boracic acid.

The strong acids, either hot or cold, show no characteristic color reaction; the compound enters solution at the boiling-point of the acid, and, in the case of hydrochloric, shows a white granular separation on cooling. Sulphuric acid develops an uncharacteristic light brown color.

The compound, like most of the organic acids, shows a characteristic reaction with ferro- and ferricyanide of potassium. In the former case no change is perceptible until boiled, when a greenish-white turbidity appears with the liberation of small quantities of hydrocyanic acid. In the latter case a trace also of this acid is set free, with the formation of a very distinct green solution, the latter reaction being very perceptible with a few drops of a 1 in 1000 solution of saccharin in water. Heated with lime, very distinct colors of benzoic aldehyde are developed.

Saccharin possesses very decided acid properties, and combines readily with alkalies or alkaline carbonates, forming andro-ortho-sulphamine-benzoates of the same, in the latter case at the expense of the carbonic anhydride, causing strong effervescence. These combinations are very soluble in water, the alkaline carbonate thus forming a ready medium for the solution of this acid, which alone is so sparingly soluble. Another advantage of some importance is, that, while the harshness of flavor perceptible in a simple solution of the acid is destroyed, the great sweetness appears to be distinctly intensified and refined.

The following shows the solubility of the saccharin in the various liquids quoted, all, with the exception of the boiling water, being taken at 60° F.:

Boiling water	0.60	parts per	100	by volume.
Cold "	0.20	"	"	"
Alcohol, .800	4.25	"	"	"
Rectified spirit, .838	3.20	"	"	"
Ether, .717	1.00	"	"	"
Chloroform, 1.49	0.20	"	"	"
Benzene	0.40	"	"	"
Petroleum ether	Insoluble.			

It is also sparingly soluble in glycerin and fixed oils, and, to a greater or less extent, in volatile oils. Benzoic aldehyde dissolves saccharin in large quantities.

Mr. Gravill states that he was somewhat disappointed at the slight solubility of saccharin in ether, as it has been repeatedly stated to be very soluble in that liquid.

The quantity of saccharin required to communicate an agreeable degree of sweetness, like sugar, differs with the material to be sweetened, but from one-half to one and one-half grains, according to taste, will be found sufficient for an ordinary breakfastcupful of tea or coffee infusion.

EFFECTS OF HOT WATER UPON THE UTERUS.

As a result of his experiments upon rabbits, M. MILNE MURRAY, in the *Revue Médicale*, reports that,—

1. The non-gravid uterus of the rabbit is subject to rhythmical contractions, one every two minutes.

2. The introduction of water at 105° to 110° F. produces an immediate state of tetany of the uterus, lasting from five to thirty minutes.

3. The muscular contraction is accompanied by simultaneous contractions of the smaller vessels, and the organ becomes exsanguine. The contraction of the vessels disappears gradually before the muscular spasm, and is not followed by dilatation.

4. Water, at 32° to 42° F., produces, after

thirty to fifty seconds, a less energetic spasm than water at 105° to 110° F.

5. The spasm is easily reproduced at short intervals by stimulating the uterus with hot water. It is not reproduced at a long interval by hot water.

6. A faradic current of short interruptions acts in the same way as hot water, and produces tetany.

These results serve to explain the employment of irrigation in the treatment of uterine affections.—*Medical Press*, October 19, 1887.

THE ANTAGONISM OF DRUGS.

Recent investigations render it probable that alkaloids or extractives formed from food in the gastro-intestinal canal, or from the tissues of the body, cause many of the diseases we are called upon to treat. These alkaloids or extractives arise from physiological or morbid changes, and if in undue quantity, or if not quickly eliminated, they may act like poisons introduced into the system from without. Some of these ptomaines and leucomaines produce effects similar to vegetable alkaloids, as, for instance, atropine, muscarine, or curare. Indeed, muscarine can be obtained not only from the fungus agaricus, but also from animal tissues.

In the *British Medical Journal* for November 12, 1887, DR. SIDNEY RINGER shows that some inorganic and organic poisons may be completely antagonized, the normal function being restored, and this being so, warrants the hope that with more accurate information we may be able to obviate the effects not only of inorganic and organic alkaloids introduced into the system, but the effects of ptomaines or leucomaines engendered in the animal body. Probably some of our success in treatment is due to our drugs antagonizing these products.

A short time ago an interesting controversy arose regarding the reciprocal (mutual) antagonism of drugs. On one side it was maintained that drugs might be mutually antagonistic, while other observers denied this statement. The former maintained that the effect of a drug might be antagonized by a second drug, which, if increased in quantity, would manifest its own individual effects, but these effects could be removed by increasing the quantity of the first drug. To take an example, atropine will antagonize the action of muscarine, and muscarine the action of atropine on the heart. To take another instance, atropine will antagonize the action of jaborandi on the submaxillary gland, and *vice versa;* if, after atropine has antagonized the action of jaborandi, a further quantity of jaborandi is administered, it will overcome the action of atropine and salivary secretion will return.

Rossbach disputed this, and maintained that while one drug increases another depresses or suspends function, and the drug which increases function can never overcome the effect of a drug that has abolished function. He admitted that when atropine arrests the secretion of the sweat-glands pilocarpine may produce perspiration, but he asserts that this occurs only with a small dose of atropine just sufficient to paralyze the secretory nerves, but not the secretory cells of the gland, and that pilocarpine stimulating the cells may produce perspiration. But he maintains that a larger dose of atropine paralyzes both the secretory nerves and the secretory cells, and after this stage no amount of pilocarpine will excite perspiration.

Dr. Ringer demonstrates that the effect of a toxic dose of calcium chloride on the detached ventricle of the frog's heart can be quite antagonized by a toxic dose of potassium chloride, and, *vice versa*, that a toxic dose of potassium chloride, sufficient not only to arrest spontaneous beats, but sufficient to prevent a strong induction shock exciting any contraction, can be antagonized entirely by a toxic dose of calcium chloride, and by the careful apportionment of the two salts their antagonism can be so nicely balanced, that the ventricle will beat spontaneously and quite naturally. Moreover, a toxic dose of potassium chloride will antagonize a toxic dose of veratrine, and, *vice versa*, a toxic dose of veratrine will antagonize a toxic dose of potassium chloride, and these two substances may be given with such equipoise as completely to antagonize each other, so that the ventricle will beat quite naturally and spontaneously. So that in the case of calcium chloride and potassium chloride, and again in the case of veratrine and potassium chloride, we may have in the circulating fluid two of each series present in toxic doses without either poison exerting any apparent influence on the ventricle, which goes on beating spontaneously and normally; but, if one salt were administered singly, it would powerfully affect the functions of the ventricle to an extent incompatible with life.

Referring first to physiological antagonism, Dr. Ringer shows that if the ventricle of the

frog, or of the eel, or of the tortoise, is fed with saline solution (.66 per cent.), contractility soon ceases, and cannot be induced by a strong electric shock. On the addition of a lime-salt, even in very minute proportions, as 1 part of lime-salt to 10,000 parts of saline solution, contractility immediately returns, but the contraction is abnormal, for the dilatation of the ventricle is greatly prolonged, so that the whole contraction lasts much longer than natural. The addition of a small quantity of a potassium-salt, as, for instance, potassium chloride, 1 part in 15,000 of circulating fluid, obviates this effect of the calcium-salt, accelerates dilatation, and induces a perfectly normal beat, and with such a solution good contractions are sustained for several hours. Here, then, we have an antagonism between lime- and potassium-salts, affecting, however, only one part of a contraction,—namely, the relaxation of the contracted muscle.

Not only are the salts of these two substances—potassium and calcium—antagonistic in physiological doses, but they are likewise antagonistic in toxic quantities.

If to a solution capable of sustaining the ventricular contractions we add a toxic dose of potassium chloride, the contractions speedily cease, even when the ventricle is strongly stimulated. Now, on adding a toxic dose of calcium-salt, the potassium chloride is antagonized, and, if the calcium-salt is added in suitable quantity, complete contractility is restored, and the ventricle beats spontaneously and normally; and, *vice versa*, if we add to the circulating fluid a toxic dose of calcium chloride, we greatly prolong the duration of the contraction, and especially retard relaxation; but, on the addition of a toxic dose of a potassium-salt, these lime effects are obviated, and normal spontaneous contractions ensue.

Here, then, we have instances where two substances in toxic doses so antagonize each other that natural beats occur; while either substance, added alone to the circulating fluid, powerfully affects the functions of the ventricle to an extent incompatible with life.

We are able, however, to analyze the antagonism between these salts more minutely still. During a contraction, four distinct sets of changes occur in the muscular tissue of the ventricle,—namely, changes occurring during the latent period, during the period of contraction, during the period of relaxation, and reparative changes, independent of those permitting relaxation. Now, potassium-salts, like veratrine-salts, greatly retard these reparative changes, so that in a ventricle poisoned by potassium chloride, these reparative changes are very slowly performed, and hence, after the completion of contraction and relaxation, if a subsequent contraction is soon induced it is a very weak one; or, if the stimulus is too soon applied to the ventricle, no contraction may occur, and cannot be induced till a short time has elapsed, and then the amount of contraction depends on the length of the diastolic pause. This effect of potassium chloride on the reparative changes a calcium-salt completely obviates.

We see, then, that a potassium-salt accelerates relaxation but retards reparation, in both these respects being antagonized by a calcium-salt, and *vice versa*. Another antagonism between potassium- and calcium-salts still remains to be noticed. If a ventricle be allowed to remain without contracting from a few seconds to a minute, then, on exciting it, the first contraction is weak, and the subsequent contractions grow gradually stronger till normal contractions occur. This staircase character of beats depends on the action of the potassium-salt in the circulating fluid, and the degree in which it occurs is in proportion to the relative amount of potassium chloride in the circulating fluid. A calcium-salt, as calcium chloride, quite obviates this effect. If sufficient calcium chloride be added, no matter how long the ventricle remains without contracting, the staircase character of the beats is prevented, or is very slight indeed.

Strange as it may appear, veratrine affects the ventricle much after the manner of lime-salts. Thus, added to simple saline solution, it will restore contractility; and further, like lime, it greatly prolongs the duration of the contraction, and especially delays relaxation of the contracted ventricle, and, like lime- and potassium-salts, we find veratrine- and potassium-salts are mutually, or reciprocally, antagonistic.

For instance, the addition of veratrine to the circulating fluid produces either great irregularity in the contractions, or very great delay in dilatation, according to the temperature of the room. This irregularity a toxic dose of potassium quite removes, and good spontaneous contractions return. Further, if the ventricle is greatly weakened or arrested by adding a toxic dose of potassium chloride, veratria quite antagonizes the potassium chloride effects, and restores spontaneous and normal contractions.

Barium- and calcium-salts, as might be expected from their chemical relationship, have many actions in common. It is interesting, too, that, although lime-salts and barium-salts both broaden the beat, causing fusion and contracture, barium-salts effect this more powerfully than calcium-salts, yet after barium has produced its effects, on the addition of a calcium-salt, instead of obtaining the sum of their united action the effects common to both salts become less. In other words, lime takes possession of the muscular tissue, excluding the action of the barium-salts. It would appear, then, that two substances affecting the same tissue in the same way, when administered therapeutically, one will not necessarily intensify the action of the other, but may replace the other, and we get the action of only one substance, and this, while having a greater affinity for the tissue, may induce a less physiological effect.

These results are very interesting, and have considerable importance, both physiologically and therapeutically. Thus, we have seen that barium and calcium both exert an influence in the same direction, but the barium molecule is the more active in respect of its influence of the ventricular contraction. If, however, we bring both molecules into action simultaneously, we see that the resultant effect, instead of being greater than with either component, is less, the lime displacing the barium and inducing its less physiological disturbance. The relation of this subject to practical medicine is very clear and important, for on the question of the combination of two drugs we must remember that the joint action of two drugs functionally similar is not necessarily greater than that of either separately, and may be even weaker than one of them given separately; for in some instances two substances having the same action do increase the action of either separately, so that we get the sum of their joint action. This is the case with lime and veratrine.

So far we have seen that substances may be antagonistic in two ways. The first we may term physiological, for instance, where two substances inducing an opposite physiological effect on a tissue may be so adjusted that the poisonous action of both is prevented. In the other case the antagonism is probably chemical, and one substance may by a stronger chemical affinity displace another poison, and this may occur, and, indeed, is most likely to occur, when both substances are chemically related and have a similar physiological effect. But there are other ways in which a substance may act as an antidote.

A lime-salt in the circulating fluid, we have seen, is necessary for the contraction of cardiac muscle. Now, a soluble oxalate destroys function, in part by combining with the lime in the circulation, and rendering it insoluble and so inoperative. Here, then, we obviate the poisonous effects of an oxalate by adding lime to the circulation. There are still, however, other ways in which we can antidote a poison. A soluble oxalate not only withdraws function by withdrawing lime, but is directly to some extent poisonous to the cardiac muscular tissue; and this poisonous action we obviate by the administration of a lime-salt, which combines with the oxalic acid, forming an insoluble, and therefore inoperative, compound. To take another instance, soluble barium-salts are poisonous to the cardiac muscle, and arrest the ventricle in systole. Now, the addition to the circulating fluid of a solution of sulphate of sodium will precipitate the whole of the barium, and the ventricle will speedily resume its normal contractility, even though the contractions had been suspended for an hour. The effect of the sodium sulphate is very rapid. Barium-salts, one would think, can prove poisonous only to the tissues after more than enough has been absorbed to combine with the whole of the sulphuric acid in the blood and tissues, and it is possible that part of the action of a barium-salt may be due to the withdrawal of sulphuric acid from the tissues.

Finally, there is another way by which the poisonous action of some substances can be greatly lessened. Some poisons prevent the changes which take place in the exercise of a function, as, for instance, the contraction of the muscle. They do not destroy the structure, they only suspend function, and this power they possess only when the poison reaches a certain percentage of the circulating fluid. If the fluid is diluted, then the percentage amount becoming less, the poisonous action is greatly reduced. This is the case with potassium and most other salts. This fact probably explains the effect of bleeding, which has been successfully employed in some cases of poisoning, and is highly successful in uræmia. The loss of blood induces a rapid absorption of the intercellular fluid and water from the gastro-intestinal canal, and so diluting the poison, lessens or removes the symptoms. If bleeding proves unsuccessful the influence of dilution suggests transfusion of a saline solution, also the free ad-

ministration of liquids by the stomach, methods Dr. Ringer long ago suggested.—*Brit. Med. Jour.*, November 12, 1887.

CREOLINE: A NEW DISINFECTANT.

Dr. F. von Esmarch, assistant at the Royal Institute for Hygiene in Berlin, publishes an important and interesting article in vol. ii., Nos. 10 and 11, *Centralblatt für Bacteriologie*, etc., upon a new disinfectant—*creoline*—which will at once arrest the attention of students, the more especially so since Prof. Dr. Eugene Fröhner, of the Royal Veterinary High School, has confirmed, by the most careful experiments, the views expressed by Dr. von Esmarch. Dr. Fröhner describes the results as "astonishing," both in regard to internal administration and external application, and believes that its use in mange and itch will be of value in political economic studies. Experiments were made with creoline and carbolic acid with decomposed material, Asiatic cholera, typhoid, and anthrax; the minutest tables of analysis are given in seconds, minutes, hours, and days, all the changes being noted, and, with the sole exception of the bacilli and spores of anthrax, creoline proved itself to be the most powerful germicide. As yet, Dr. von Esmarch is unable to say why it fell behind carbolic acid in anthrax. In the first trial the results were equal, but in the second experiment creoline did not manifest such germicidal power as the carbolic acid. Dr. von Esmarch says, "All of my liquids were thoroughly decomposed, and emitted a most offensive odor. This disappeared almost entirely when a small quantity of creoline was added, and the mixture agitated every few seconds. The same addition of carbolic acid produced no effect, even when a much larger percentage was used." He also adds, "The action of *creoline* preparations surpasses by far those of carbolic make."—*Boston Medical and Surgical Journal*, November 10, 1887.

THE ANTISEPTIC TREATMENT OF WOUNDS.

Mr. W. J. Penny summarizes the important points in the antiseptic treatment of wounds as follows:

"To recapitulate the antiseptic or aseptic treatment of wounds: 1. Arrest all hemorrhage, thus preventing the accumulation of blood-clot, the nidus for development of micro-organisms. 2. Remove all foreign bodies, such as dirt, detached pieces of bone or tissue. 3. If foreign bodies or micro-organisms have gained an entrance, purify thoroughly with an efficient antiseptic. 4. Provide very free drainage, in the most dependent part if possible. 5. Bring the parts into accurate apposition, like to like; but carefully avoid tension, especially of the edges of the wound or in damaged or unhealthy tissues. 6. Apply a large dressing sufficiently impregnated with a reliable antiseptic, and very absorbent and elastic. 7. Bandage firmly and evenly to get elastic compression. 8. Elevate the part to lessen the blood-pressure and effusion while the vessels are weak from the injury. 9. Give absolute rest; change the dressing as little as possible. Visible discharge is the indication if the dressing is reliable. 10. Attend to the general health and give a free supply of good food and fresh air, in this way promoting the resisting and healing power of the tissues. Recognition of these principles, their study and adoption, are of as much or more importance to a surgeon than a knowledge of anatomy or manual dexterity. By them you take surgery out of the region of chance and make it much more an exact science. If you happen to have an infectious case, let me impress upon you, gentlemen, not to look on it as an unavoidable accident, but recognize it as being due to some mistake in your chain of treatment, to be found out and in the future guarded against. None of us are free from mistakes or accidents; the best surgeon is he who has the least number, who recognizes that he is not infallible, but strives to discover his mistakes, and from them learns lessons for his future guidance."—*Lancet*, October 29, 1887.

ACETANILIDE AND ANTIPYRIN IN THE TREATMENT OF EPILEPSY AND CERTAIN ALLIED DISORDERS.

The control of antipyrin and acetanilide manifest over the nervous system has led many observers to use them in the treatment of a variety of nervous affections. Medical journals at home and abroad have devoted considerable space to the reports of cases so treated, which, as yet, are, however, so few in number as to scarcely warrant the deduction of any positive conclusions. Dr. Joseph Leidy, Jr., in the *New York Medical Journal* for October 29, 1887, reports a number of cases of epilepsy, hystero-epilepsy, hysteria, insomnia, neuralgia, and lumbago in which

these drugs were used, with results which, though encouraging, are hardly sufficient to warrant their maintaining the position which many have alleged for them. The cases of epilepsy were selected irrespective of their causation or variety. Those of tabes dorsalis were all of syphilitic origin. Headaches were mostly of the congestive type. Neuralgias consisted of the trigeminal, intercostal, visceral, and suboccipital varieties. Notes of thirteen cases are published, which were evidently those in which the results of these drugs were most favorable. Dr. Leidy summarizes his results as follows :

Of thirty-six patients with epilepsy, fourteen were greatly benefited by acetanilide and three by antipyrin. Acetanilide aggravated the attacks in four cases.

In five cases of hysteria antipyrin proved itself a useful remedy, and worthy of further trial ; the results from acetanilide were negative.

In three cases of hystero-epilepsy the results from both drugs were negative.

In four cases of insomnia the use of acetanilide was attended with some benefit. Antipyrin failed signally, although in one case, due to nervous exhaustion attendant upon sexual excesses, it proved effectual in relieving the headache and producing a refreshing sleep.

In fifteen cases of supraorbital and suboccipital neuralgia, nine were greatly relieved by acetanilide and four by antipyrin.

In two cases of intercostal neuralgia acetanilide gave immediate relief.

In five cases of nervous headache great benefit was obtained from acetanilide. Antipyrin proved of doubtful utility.

Of seventeen patients with sciatica acetanilide benefited eight ; negative results with the remainder.

Of ten cases of lumbago, seven were relieved temporarily and two permanently by acetanilide.

In six cases of rheumatism pain was greatly relieved by acetanilide, and in one case by antipyrin.

In five cases of tabes dorsalis the gastric crises and headache were relieved by acetanilide, formication disappeared in four cases under observation ; in one case no benefit was derived.

In conclusion, it may be said,—

1. *In epilepsy*, when acetanilide does good, its action is rapid ; it does so by diminishing the violence and number of the attacks, and, as it has a tendency to aggravate the disease in some cases, the nature of which could not be determined, although it occurred only in those cases with a marked hereditary predisposition, its use should not be continued over two weeks unless some benefit has been obtained.

Cases of *petit mal* prove the more amenable to treatment, though in two cases of *haut mal* the drug was of great service. Antipyrin has proved itself inferior in every respect to acetanilide. Neither remedy is to be used as a substitute for the bromides, but simply as an addition to the limited number of drugs now at our command.

2. *As an analgesic* acetanilide has proved itself a valuable remedy ; the majority of the cases treated have been benefited. Antipyrin appeared beneficial in several cases, though it is not to be ranked with acetanilide.

3. *As a hypnotic* further experimentation is needed, but from the cases under observation both drugs are of doubtful efficacy.

In the administration acetanilide was used first and considered the safer drug. From acetanilide there are no objectionable after-effects, except it be cyanosis, which only occurs after the ingestion of large doses, and usually in cases attended with marked elevation of temperature ; on the other hand, collapse, disturbances of the gastro-intestinal tract, respiration, and circulatory apparatus, with fatty metamorphosis of the liver and kidneys (Dr. Porter, in *New York Medical Journal*), prove sufficient objections to the use of antipyrin.

The dose of acetanilide varied from gr. iii to x ; that of antipyrin from gr. x to xv.

TERPINHYDRATE.

Dr. S. Rabow says in the *Therap. Monatshefte* for August, 1887, that among the many new remedies which have found their way into therapeutics, terpinhydrate and terpinol have chiefly come into use. If oil of turpentine and water be allowed to stand for a time, upon the walls of the vessel will be found small needle-like crystals. These are nothing else than terpinhydrate, or more correctly, terpin-dehydrate ($C_{10}H_{16}.2H_2O + H_2O$).

The production of this interesting body is as follows : A mixture of four parts of rectified oil of turpentine, three parts of alcohol (80° C.), and one part of nitric acid is put in large, shallow porcelain dishes and allowed to stand for three or four days. The crystals which have formed are then collected and allowed to drain thoroughly ; they are then pressed between absorbent paper, and are re-

crystallized in a cold solution of ninety-five per cent. of alcohol. The product is about twelve per cent. of the original turpentine oil.

Terpinhydrate is a large, colorless, odorless, rhombic crystal, having a faint aromatic taste. It is with difficulty dissolved in cold water and turpentine oil, more readily in hot water, alcohol, ether, or carbohydrates.

The first careful examination of its physiological actions was conducted by Lépine, of Lyons, in the year 1885. He found that the drug had a similar action upon the respiratory organs as the oil of turpentine, and also acted similarly both upon the kidneys and nervous system. Lépine states that small doses (.2 to .6 grm. = 3 to 9 grs.) increase the bronchial secretions and facilitate expectoration. Large doses diminish the secretions and lessen the respirations to a marked degree, and produce a cessation of expectoration. The author has used the drug in over two hundred cases of bronchitis, using the above-named small dose, almost invariably obtaining the desired results.

Germain Sée found that large doses were useful in different states of phthisis pulmonalis in the checking of the copious secretions.

In cases of bronchitis where the bronchial tubes were surcharged with secretions and when dyspnœa existed, the remedy always acted with certainty. Also in fresh hæmoptæ it proved to be an invaluable hæmostatic, as it produced its results more rapidly than ergotin.

Kien, Clermont, Ferreira, Morra, Chéron, and others have recently referred to its value in diminishing the secretions in bronchitis and bronchocele. The usual dose advised being from .75 to 1 grm. (12 to 15 grs.) daily.

Guelpa alone reaches different conclusions. He gives but little weight to the effect of terpin upon the mucous membrane of the bronchia or its effect on the kidneys, and hence throws it aside, substituting for it terpinol.

Lépine also found that terpin acted upon the kidneys, and thus could be regarded as a direct diuretic.

Small doses are sufficient to cause a marked increase of urine. Its value for affections of the kidneys is judged to be highly probable, as large doses given to dogs have resulted in hæmaturia and albuminuria. Its asserted value in cystitis and chronic gonorrhœa requires additional evidence.

The well-known property of turpentine oil of relieving certain neuralgias, especially of the ischias, etc., is observed by Lépine to be also a property of the terpinhydrate. He found in many such cases that doses of 1 grm. (15 grs.) of terpin afforded as much relief as would be given by several grammes of the oil of turpentine. According to our present knowledge, the use of the drug may be continued for a long time without producing injurious effects.

The only disagreeable accompanying symptoms which have been observed (and these rarely) are purging, pain in the epigastric region, and meteorismus.

In order to avoid these symptoms it is advisable to take the remedy during meals.

The size of the dose depends very naturally upon the nature of the result desired. Daily doses of .2 to .5 grm. act as an expectorant, whilst doses of 1 grm. *pro die* check the secretions, and may be also used to alleviate pain It may be given in the form of pills or in wafers, or in a dilute alcoholic solution.

℞ Terpini hydrat., 3 grm.;
Sacch. alb.,
Mucil. gum arab., q. s.
Ut f. pilul. No. xxx.
S.—One pill three times a day.

℞ Terpin. hydrat., 10 grm.;
Spirit., 150 grm.;
Aq. dest., 100 grm. M.
S.—One tablespoonful three times a day.

℞ Terpin. hydrat., 5 grm.;
Glycerin, 30° C.,
Spirit., 95° C.,
Syrup simpl., aa 70 grm.

(The terpin should be dissolved in the warm glycerin, and the mixture of alcohol and syrup. simpl. should be added, and the whole well shaken. Each tablespoonful contains about .5 grm. of terpin. *Vigier* and *Chéron.*)

The author's experiences with terpin hydrate are very favorable, and sufficient, he says, to warrant his giving conclusive testimony as to its value. As, however, many questions upon the subject have been directed to him, he went still further and instituted inquiries among several practitioners who had large and valuable opportunities of observing its effects. He speaks of being especially indebted to Dr. Lazarus, of Berlin, and to Dr. R. Hausmann, of Meran, for a full and interesting statement of their experiences. Dr. Lazarus writes as follows:

"I consider the pill form the most useful, as in the solution so large an amount of alcohol is necessary that the effects of the latter are considerable. I have also seen that even doses of 1.5 to 2 grm. daily, when taken in pill

form, and during meal-time, produce no unpleasant symptoms. Indeed, I believe that only large doses can be depended upon to give an assured result.

"When an intense irritation of the mucous membrane of the bronchi is observed, accompanied by a meagre secretion, the use of terpin is indicated. It always increases the secretion, making it more watery. It lessens the irritation and aids and facilitates expectoration. In eight to fourteen days the catarrhal symptoms gradually disappear. My observations, which have resulted from wide experience, will be endorsed by very many of my colleagues who have largely used this remedy."

Dr. Hausmann does not write quite so favorably. He says,—

"Sée says in the third part of his 'Medical Clinic,' page 225, 'Terpin is an energetic modificator of the respiratory mucous membrane and a strong antisecretorium. It lessens the secretions in pulmonary catarrh and chronic bronchitis.' Although I have firmly adhered to the use of terpin in pulmonary and bronchial catarrh I have never yet observed a complete stoppage of the secretion, although I have given doses of .80 to 1 grm. daily. In nearly all the cases, although the secretion diminished with rapidity, I observed the effects to be but temporary. I have noticed, however, that patients have been able longer to endure the use of terpin than trupentine oil. Sée believes that after a continued use of the drug no gastro-intestinal troubles result; but my opinion is that this is questionable.

"I have found neither the pill form nor the alcoholic solution so valuable as the practice of giving it in wafers.

"As a deodorizer the oil of turpentine is decidedly better than terpin."

JHAMBUL—A NEW REMEDY FOR DIABETES.

The jhambul is a small evergreen tree, indigenous to the humid region of India, especially to the Malayan peninsula. Both the bark and the seeds in this plant would seem to possess medical properties, the seeds apparently being more active. Dr. W. H. Morse, writing in the *Maryland Medical Journal* for October 29, 1887, states that he has employed the powder of the bark and seeds in doses of 5 grains three times a day. He claims that the effect of this drug is to increase the vaso-motor and reflex functions of the spinal cord, producing a general rise in blood-pressure, especially in the renal arteries. Nausea is occasionally produced, and respiratory movements are increased in number and depth and intestinal peristalsis increased. In diabetes it is said to lessen the specific gravity and quantity of the urine and diminish the amount of sugar, while the abnormal thirst and other unpleasant symptoms of the disease are overcome. Before endorsing these statements, which we must admit are apparently confirmative of other papers on the same subject, we must wait for extended experience. To be sure, if the drug proves successful in arresting these diseases, we can afford to laugh at the explanation of its action, given as follows by Dr. Morse: "The formation of sugar in the urine is arrested by a prevention of the formation of starch."

ANTIPYRIN IN SEA-SICKNESS.

The Paris correspondent of the *Lancet*, November 12, 1887, writes: "The Société de Biologie has devoted part of its last two sittings to the discussion of the different means recommended for the relief of sea-sickness. A note was presented by M. Hentz on the best way of administering cocaine, and received without any expression of opinion. M. Dupuy said that sea-sickness was more severely experienced by dyspeptic subjects, and particularly those who had dilatation of the stomach. In eleven cases he had given antipyrin in doses of from 2 to 3 grammes for a few days before embarking, and the patients had all informed him that they had been free from sickness. M. Dastre said he had instituted a series of experiments upon animals, imitating as closely as possible the movements of 'pitching' and 'rolling.' He had found that there was an incredible displacement of the abdominal viscera, which strike against the diaphragm and cause the gastric uneasiness. The body struggles with these displacements by means of muscular contractions, and the respiratory rhythm accommodates itself to them. Professor Brown-Séquard remarked that this theory of visceral displacement was very old, and one which he had been able to verify in his frequent passages across the Atlantic. It was evidently the view entertained by Wollaston, who recommended Arago to place a pad over his stomach when he crossed the Channel. M. Maurel had no doubt as to the influence of the stomach, but thought the cerebral shock

also played a part in the determination of the symptoms, inasmuch as the sickness always occurs when the boat is going down, never when it is being lifted up. The best preventive was lying on the back. Beyond the statement that sea-sickness is associated with dilatation of the stomach, and the hope held out by M. Dupuy that in antipyrin we now possess a remedy for it, there was nothing new in the views expressed by the different speakers. I have referred, however, at some length to the subject, because my own seafaring experience has been somewhat extensive, extending over intervals during the last fifteen years, and including some kind of trial of every new drug recommended. Until a month ago the plan I always recommended was to take bromide for some days before going on board, and, if discomfort was felt notwithstanding, the dorsal decubitus was to be adopted. This, together with champagne, is generally what the transatlantic captains advise. In a recent trip to New York I tried two other remedies. The surgeon of the ship recommended me tincture of capsicum, and I had also taken a supply of antipyrin. As far as one case goes the result of the antipyrin was most satisfactory, and I can to this extent endorse the experience of M. Dupuy. The capsicum was also serviceable as a palliative, for several persons who had taken it continued to ask for it, but it did not arrest the sickness like antipyrin. A fellow-passenger who suffered from dilatation of the stomach with *clapotement* was not sick at all."

THE PHYSIOLOGICAL ACTION OF THE OIL OF TURPENTINE.

Notwithstanding the fact that the oil of turpentine has been used for many years with success in certain morbid conditions, but little effort has been made to study its relation with the animal organism other than by the bedside. Dr. H. A. Hare, in the *Medical News* for November 19, 1887, relates a few experiments which he has made in this connection, of which the following is a summary:

1. The oil of turpentine in small doses, resembling those ordinarily given in practical medicine, produces an increase in the number of the cardiac beats due to a direct stimulant action on the heart.

2. In larger doses it produces distinct slowing of the pulse, due to a stimulation of the pneumogastric or inhibitory centre.

3. That its influence on the vaso-motor system, if at all, is very slight, either with large or small doses.

4. That poisonous doses (5 c.c. to 10 c.c.) (♏ 80 to 160) produce death by cardiac failure when injected directly into the jugular vein.

5. That the drug in small doses increases reflex action somewhat, but in large doses decreases it, the increase being due to a stimulation of the spinal cord, and the decrease due to depression of the sensory side of the cord and afferent nerves.

CHLORIDE OF AMMONIUM IN THE TREATMENT OF HEPATIC DISEASE.

In his monograph on the treatment of hepatic disease, Surgeon-General W. Stewart showed that chloride of ammonium in hepatic congestion produces a local depletion from the portal capillaries with each succeeding dose of the drug, and at the same time, by a species of auto-transfusion from the portal into the general circulation, the entire portal system, from its origin in the venous radicals in the intestinal mucous membrane, is freed from engorgement, and thus the liver is not relieved from congestion and its functions restored, and the occurrence of dysentery, so apt to supervene in hepatic congestion, and particularly in tropical abscess, is prevented. The depletion of the congested abdominal viscera thus effected, unlike that by leeches or other local means, is not attended with depression or loss of vital fluid, a loss which, in such cases, is but ill borne. Since the publication of his first paper on this subject in 1870, Dr. Stewart states that his experience with this drug has been quite extensive, and he is able to confirm the testimony of Murchison, that in doses of 20 grains two or three times daily it induces free diaphoresis, increases the flow of urine, diminishes the portal congestion, and relieves hepatic pain. He also believes that it stimulates the absorbents, especially those of the liver, and would seem to affect absorption of hepatic abscesses.

The symptoms produced by this drug in hyperæmia of the liver are stated by Dr. Stewart to be characteristic, and are specially to be noted, since, so far from being evidences of the medicine disagreeing, they are signs of its successful action. They are only evident as long as the liver is congested, and Dr. Stewart even goes so far as to claim that their occurrence after the administration of the drug in any given obscure case may be considered

diagnostic of hepatic disease. The symptoms now to be described occur shortly after the medicine is taken, in from five minutes to half an hour. Sometimes a "shock" is felt, or as if "something gave way" in the side; at other times a succession of shocks is experienced in the hepatic region, accompanied or not by a pricking sensation ("pins-and-needles"), or as if cold water were trickling down the side; or the action is described as that of "a pulling" from one hypochondrium to the other, or from the margin of the right costal arch upwards and backwards, as if through the liver; or a "clawing," "working," or "gnawing sensation" is spoken of as felt by the patient. When a single sharp shock is experienced in a debilitated, nervous, and susceptible subject, it is often severe. Immediately afterwards, however, the severe hepatic pain vanishes, and never again returns with its original severity; and with each succeeding dose a sensation of "pulling" only is felt in the hepatic region, till at length all sensible action ceases with the removal of the hepatic congestion, the case being one of simple enlargement of the liver. With the local actions excited in the liver and related parts—through reflex nervous action—when a full dose of the drug has been taken, motor impulses are similarly communicated to the muscles of the intestinal canal, causing its peristalsis to become more rapid and energetic, as evidenced by the "twisting" and other movements experienced in the situation of the duodenum, or all over the abdomen, and which at times are more sensibly felt in particular parts, in the situation of the umbilicus, or in the inguinal region. Simultaneously with or closely following the above phenomena, the abdominal muscles may be thrown into tonic contractions, which are perceptible at times to both sight and touch; and pulsatile movements are felt, and are sometimes visible, along the margins of the right inferior ribs. All these phenomena are highly purposive, contributing, with other vital actions and processes brought about by the drug, to diminish portal congestion, restore the diseased liver to a healthy state, and afford relief to the entire system.

The following is a summary of the auxiliary treatment, diet, and management of congestion of the liver, and mode of administering the ammonium chloride:

Bearing in mind what has been said of the therapeutic effects of the drug in hyperæmia of the liver, and the indications to be drawn from the symptoms and pathology of the disease, the first thing to be done is to put the patient to bed, there to remain, in acute cases, during the whole course of the disease; in short, till the congestion, pain, and general and local distress and uneasiness shall have subsided, and that the patient may have no occasion to quit his bed, a bed-pan and urinal should always be at hand, as well as a trusty attendant to minister to his wants. By the recumbent position and the avoidance of all sudden and violent movements, mechanical rest and support are given to the enlarged, weighty, and oppressed or painful organ. The horizontal position, too, facilitates the auto-transfusion of the blood from the portal system, through the hepatic capillaries, into the general circulation, under the influence of our special remedy,—a process which will be better understood now that the reader is in possession of the details of the local signs expressive of the effects produced by it: the excitation of the muscles of the intestinal canal to increased peristalsis, and those of the abdomen and thorax surrounding the liver to tonic contractions, by which muscular pressure is brought to bear on the radicals of the portal vein, and on the liver and gall-bladder, which not only hastens forward the entire portal stream, but may squeeze out of the liver some of the superfluous blood, as well as free it and the gall-bladder from retained bile. By the increase of the functional activity of the liver, as well as the increased flow of blood to the skin, as a further result of its action, a *vis a fronte* is brought into play in aid of the *vis a tergo* above described, by which the equilibrium of the entire circulation is speedily restored. The free perspiration induced by the drug is also promoted and chills avoided by the rest and warmth of bed. It is to this latter stage of its operation that much of its value is due,—the free diaphoresis favors sleep, while the nervous system generally is exhilarated and soothed, and the patient almost entirely relieved from all his distressing symptoms.

It is equally important that the congested (or, it may be, inflamed) liver should enjoy, as far as possible, physiological rest. To this end, on no account must solid food be given to the patient, and wine, beer, or other alcoholic stimulants must be strictly prohibited. The diet must be of the least irritating character, and only small quantities of milk, beef-tea, or farinaceous articles should be taken at a time. Barley-water may be taken freely as a drink. If there be diarrhœa, the patient passing frequent loose bilious or dark-colored

motions, a pill composed of two grains of mercury and three grains of Dover's powder, repeated every two hours till four or five have been taken, will be found the most effectual means of checking it without the risk of setting up gastro-intestinal irritation. Looseness of the bowels, however, does not contraindicate the use of the chloride of ammonium,—indeed, it is in itself the best remedy in cases of diarrhœa associated with hepatic congestion. The only condition which contraindicates the immediate use of the drug in acute cases is the existence of a combined hot and dry state of the skin with pyrexia. Under such circumstances its use should be preceded by a few small and frequently-repeated doses of solution of acetate of ammonia, till the skin is rendered moist and perspirable. Pyrexia being absent,—or, if present, the skin being soft and perspirable,—the chloride should be at once commenced and persistently administered in doses of 20 grains twice or thrice daily, with strict attention to the rules above laid down as to diet, rest in bed, etc., till it no longer produces sensible effects, or till all local uneasiness, hepatic pain, and tenderness have subsided. Fomentations or hot bran-bags applied to the seat of pain in the side will be of use in aiding determination to the skin generally, as well as by their local soothing effects.

Dr. Stewart reports in the *Lancet* for October 22, 1887, typical cases of that state of the disordered liver, which, commencing in imperfect discharge of the liver-functions, when long continued terminates in congestion of the portal veins and engorgement of the vital ducts. If this stage of the disease be neglected its tendency is to terminate in subacute inflammatory reaction with marked tendency to suppuration. In this, as in other forms of tropical hepatitis, ammonium chloride would appear to be the one special remedy, and the statements of Dr. Stewart would appear to be confirmed by the statistics and cases published in his monograph.

These results of Dr. Stewart we believe are in unison with those of other practitioners. The remedy has been used in chronic torpor of the liver and chronic hepatitis to some extent in this country with asserted good results, and is referred to in such diseases in at least some of our standard treatises.

METHYLAL.

Dr. B. W. Richardson, in a paper read before the Medical Society of London on October 24, 1887, continues his studies of methylal (*Medical Press*, November 2, 1887). His conclusions may be summarized as follows:

1. Methylal is hypnotic and antispasmodic.
2. Its action lies between ethylic alcohol and ethylic ether. It may be looked on as a volatile alcohol, and resembles closely pure methylic alcohol in action.
3. It can be administered by inhalation as vapor, by hypodermic injection, and by the mouth in aqueous solution.
4. It reduces arterial tension, and by local action excites glandular activity.
5. The sleep it induces is not profound unless the dose be excessive. It is quickly eliminated, and leaves no serious effects. It causes no vomiting or stomachic disturbance.
6. A fatal dose by inhalation kills by complete relaxation of the muscular fibres of the heart, leaving the heart distended with blood and the vascular organs intensely congested.
7. It combines with ether, alcohol, amyl nitrite, and many other remedial agents with which it acts in concert, while it equalizes their action by reason of its own solubility.
8. Its tendency is to maintain the fluidity of the blood, and it may, therefore, be of service in combination with ammonia.
9. It promises to yield a safe and effective anæsthetic mixture in combination with ether.
10. It reduces the animal temperature, but not to the same degree as common alcohol.
11. Used as an anodyne it passes out of the body without producing organic injury when not often repeated.
12. But, like all bodies of its class, it must be given in increasing quantities in order to keep up its effects, and it would soon yield evil as well as good by its habitual use in the community at large.

THE EFFECTS OF ANTIPYRIN ON CHILDREN IN SCARLATINA AND BRONCHITIS ACUTA.

Although the value of antipyrin as an antipyretic has been largely discussed and almost universally acknowledged, its use in the above-named diseases has been almost, if not entirely, disregarded. Can it be that the drug has not been tried in these serious ailments, which are always accompanied by a high fever? Or has the fear of collapse, which sometimes occurs, caused the physician to abstain from its use? The only use to which antipyrin has been put among children (at least the only account published) was in

whooping-cough, where small doses were recommended (*Therap. Monatshefte* for May, p. 201). The result of the experiences of Dr. Julius Friedlaender, which appeared in the *Therapeutische Monatshefte* for August of this year, cannot therefore fail to be of interest to the profession. His experiments were on children under six years of age, suffering either with scarlatina or bronchitis acuta.

It may also be mentioned that the remedy was always willingly taken by the little patients when given in wine or raspberry syrup.

In scarlatina the drug did not seem to have any effect either on the duration of the disease (four to six weeks) or on the accompanying complications, with the exception of catarrh of the air-passages. On this it seemed to have a beneficial effect. This, when treated with antipyrin, was never severe. In every case, after taking the remedy from one to three times in twenty-four hours, in doses of .6 grm. (9 grains), the children seemed brighter, ceased gritting their teeth, and gladly took milk, wine, or bouillon, and were also willing to be freely examined, which had not been the case before. In nearly every case perspiration soon began, was followed by tranquil sleep, and in about two hours the temperature had sunk to about 38.5° C., the pulse was about 120, respiration easier and not so rapid. These results took place in some cases after a single dose of .6 grm. (9 grains), but the effects of the drug only lasted from eight to ten hours, according to the patient's age, and the dose had to be repeated once or twice in twenty-four hours. All the children (fourteen) recovered.

In one case of otitis interna suppurativa bilateralis, accompanied by extreme restlessness, gritting of the teeth, and twitching of the extremities, and with a temperature of 40.2° C., the disease being in its third week, the author was able to produce a state of "euphory," which lasted for twenty-four hours, by means of three .6 grm. (9 grains) doses of antipyrin, each dose given within thirty minutes of the other.

The patient was a little girl, aged 5. These heroic doses were repeated when the violent symptoms of the malady had again been gradually increasing for about twelve hours. The author says that he would have used the remedy again as soon as the euphory had begun to subside, but was hindered from doing so by the parents of the child, who looked upon the remedy as a "highly dangerous drug," and would not permit of its use until the violent symptoms had again manifested themselves; then they would implore him to administer it again. He would then be forced, "for precaution's sake," to sit by the bedside until full action had taken place, which usually was in about two hours. The child recovered in five weeks after the gradual use of 1.8 grm. (28 grains) of antipyrin.

The otorrhœa, however, continued for some ten weeks longer in spite of an energetic use of "Politzer," dry cleansing, and subsequent filling up of the passage with acid. boric. pulv. (although the decomposition of pus was in a measure checked by this treatment), and the little patient, who, during her whole illness, had not spoken a word, and had only seemed to hear slightly when under the full influence of antipyrin, remained deaf and dumb.

Dr. Friedlaender states that his experience with the drug in bronchitis acuta of children has been far richer. He confesses that before he definitely settled upon the use of antipyrin he had lost many children with this disease. The duration was usually two or three weeks. Since he has used antipyrin in bronchitis of children the disease seldom continues for over a week. The author says that he must call attention to the fact that antipyrin has only proved of such great value in cases which were marked by a high fever, whereas those cases where the temperature was only moderately high (below 39° C.) were but slightly affected by the drug. From which it would appear that antipyrin is far more potent in bronchitis, when the catarrh is hindered from loosening by a high temperature.

Another peculiar fact that the author notes is that antipyrin acts far better on well-kept children than on those of poor parentage who are poorly taken care of.

Perhaps it is because the children who are well cared for are better able to stand the weakening accompanying symptoms of antipyrin. Since Dr. Friedlaender has used antipyrin in such cases which are especially suited for its use,—viz., when the temperature is over 39° C. and the patient well nourished,—all the children (thirty in number) have recovered after only a week's illness. And also among weakly children where the temperature was below 39° C. a careful use of the drug gave very good results, and the author states that he has lost far fewer patients of this class than before using antipyrin.

During a recent murderous epidemic of

bronchitis, which raged last winter in the vicinity of the author's labors in Russia, the mortality was fifty per cent. in the cases observed by himself and his colleagues. By the use of antipyrin, however, the mortality of the little sufferers was reduced to 0 per cent. among the children who came under the first category, while the mortality of the children coming under the second category (the number of which the author cannot exactly give) was, at the very highest, estimated to be only ten per cent.

The author's method of using the remedy is as follows: As soon as apathy is noticed (the temperature being usually then over 39.5° C.) he at once gives .6 grm. (9 grains) to .9 grm. (14 grains) of antipyrin in one dose. Doses of .6 grm. (9 grains) will be sufficient for children under two years of age, and its effect will last for about twenty hours, while doses of .9 grm. (14 grains) in larger children (under five years of age) will only be sufficient for about twelve to fifteen hours; therefore it will be necessary to give the last-named dose twice in twenty-four hours in order to insure the desired effect. Most of the little patients perspire freely after taking the drug, then fall into a gentle and refreshing sleep, from which they awake in one or two hours perfectly bright and happy and contented. Others, again, will improve more slowly and gradually without either sleeping or perspiring. The cough loosens; breathing becomes easier and less rapid; there is an inclination to play. In addition also the author always orders wine, food which is rich in albumen, gentle aperients, and caffeine.

℞ Caffeine puri, .06 to .2 (i to iii$\frac{1}{2}$ gr.);
Sod. bicarb., 1.5 to 3 (xxiv to xlviii gr.);
Aqu. fœnicul., 60 (℥ii);
Syr. ipec., 30 (℥i).
M. S.—Every half-hour to every two hours one teaspoonful.

In three to five days the change for the better becomes very marked. Although there is a loss of appetite, the child's cough will be much easier, its general appearance brighter, and it will be active and playful.

Usually during convalescence the author continues to give half-doses of antipyrin once a day, .3 to .45 grm. (or 4$\frac{3}{8}$ to 7 grains). The children who perspire freely after full doses of the drug usually recover more rapidly than others.

"I hope," says the author, in conclusion, "that my observations may throw further light upon the interesting actions of this new antipyretic, and especially that they may lead to further inquiries and investigations concerning its beneficial actions in bronchitis acuta of children."

CASCARA SAGRADA IN CONSTIPATION.

Dr. John W. Farlow read a paper on the uses of cascara sagrada in the treatment of constipation at a recent meeting of the Suffolk District Medical Society, in which he spoke in the highest terms of the use of this remedy (*Boston Medical and Surgical Journal*, October 27, 1887). According to his experience the cases for which cascara sagrada is particularly adapted are the chronic cases, and especially those with weak digestive organs. For such cases this is far superior to rhubarb, senna, aloes, liquorice powder, and the usual laxatives, either alone or in various combinations. For acute cases its peculiar properties are not so much required, although it generally acts promptly, surely, and without secondary constipating effect. The different preparations which may be employed are the cascara cordial and solid extract and the fluid extract. Dr. Farlow generally uses the fluid extract.

It is an active and reliable preparation; the dose is small, and can be easily regulated by increasing or diminishing the number of drops taken at a time. The taste is bitter, to which some object, while others find it not unpleasant. To the latter it can be given in water or with equal parts of glycerin in water. Most of the substances supposed to disguise the taste only add a sweet to a bitter, and the combination is to many worse than either alone. The fluid extract of liquorice is perhaps as good an excipient as any. Cascara cordial has an agreeable taste, and is preferred by many. The dose is of course larger, and is not so easily regulated as the fluid extract. The solid extract is given in pill form, and consequently can be taken without the bitter being tasted. If, however, the dose in each pill proves too large, a new lot with a smaller dose has to be procured, which is a disadvantage as compared with the fluid extract.

The dose of the cordial is about a teaspoonful morning and night, or oftener. The solid extract is given in doses of 2 grains or less three times a day. The dose of the fluid extract is from 5 to 25 drops, and may be taken as follows: if the case is of long standing, and one in which many drugs have been tried, 10 or 15 drops are to be

taken in water before each meal and at night. If that does not cause one soft dejection a day, in two or three days the dose should be 25 drops four times a day, and tell the patient to take sufficient to have one dejection a day. Then, in a few days at any rate, or immediately, if he has more than one stool a day, he is to diminish the dose from 30 to 25, 20, or 15 drops, but always enough for one soft stool a day. It is better to diminish the quantity taken at a time than to lessen the number of times. It will be found that 5 or 10 drops at night often prove sufficient. It is well to omit the medicine from time to time, and it can frequently be dispensed with altogether. If necessary to resume it, let only the amount be taken that was previously found to be sufficient.

Dr. Farlow's paper evoked considerable discussion. DR. MINOT stated that he had used this remedy to a considerable extent in the treatment of constipation, always with the most satisfactory results. He had found the dose to be variable: in some cases the amount required to produce the desired action being considerably greater than in other cases, without any appreciable difference in the patients. Ordinarily he had prescribed 10 drops, which might soon be reduced after a few doses to 5 drops, and then discontinued entirely.

DR. C. P. PUTNAM only had used cascara to a slight extent: his results were variable and uncertain, a result probably to be explained by the small number of cases in which he had used it.

In reply to the question as to whether the degree of constipation which exists is in any way a guide to the dose of cascara which should be given, Dr. Farlow replied that he knew no guide to the exact amount which would be required in any case, but each patient must try the drug in a dose of moderate character, and increase or diminish the amount as the case requires. Dr. Landowski, who introduced it into France, and who experimented largely with it in the clinic of Dujardin-Beaumetz, as did also Dr. Eymeri, draws the following conclusions as to its use: The medicine purges easily, generally without colic, at a relatively small dose; its use not only does not excite anorexia, but, on the contrary, it excites the appetite, which is especially worthy of remark; at the end of ten or fifteen days of its employment, one can often stop the medicine without the constipation beginning again. If at the end of a certain time the constipation sets in again, one has only to take the medicine again for three or four days. He thinks it particularly good in cases of intestinal atony, and, when it succeeds, he does not know of any better means of combating obstinate constipation.

CLINICAL NOTES ON SULPHATE OF SPARTEINE.

DR. J. PRIOR, docent in Bonn, prompted by the experiences of Germain Sée, has for some time past been using sulphate of sparteine as a heart-remedy in general, but found it especially useful in affections of the cardiac muscles, be it either change of tissue or weakness; further, also in valvular troubles when the compensation was affected, and particularly when the pulse was irregular, jerky, or arhythmic. The author sums up the results of his observations with the drug in the following notes:

1. Sparteine increases the secretion of urine. This, in healthy patients and under certain circumstances, may take place without the circulation being materially affected.

2. Whether, according to the views of H. Leo, sparteine owes its diuretic property to its effect on the epithelium of the kidneys or not has not yet been proved. It is, however, very possible that the effect the drug has on the heart's action increases the quantity of urine, as the author's experiments have proved to him beyond all doubt that sparteine sulphate materially affects the pressure of the blood.

3. It must also be mentioned that, although sparteine had a beneficial effect on almost every heart-trouble, yet in several cases it had no apparent effect whatever. It acted best when used in cases of irregular compensation which resulted from valvular affections.

4. The drug usually commences to act in about two or three hours after it has been administered, and the effects last for a few hours, but in some cases even for as long as three days.

5. If the remedy has overcome the irregularity of compensation it will keep the heart's action regular for some time, as is shown in notes 12 and 13.

6. In patients where the secretion of urine has been suppressed by the affection of the heart's action, the drug will perform the double duty of regulating the heart's action and at the same time increasing the secretion of urine; the œdema and the serous transudations will also disappear.

7. The pulse frequency will be lessened,

which is explained by the heart's action having been regulated, and the pressure of blood increases.

8. It will be well to mention that also in those cases where sparteine has no apparent effect on the heart's action and has failed to regulate it, yet the pressure and difficulty in breathing was always relieved.

9. No beneficial effects were observed from the drug when used in cases of bronchial asthma.

10. On one occasion only were evil after-effects observed to follow its use, and that was after a dose of 2 grammes (31 grains). The pulse once became irregular. This was the only case where any disagreeable effects were noticed. Above all, the drug seems to have no injurious or irritating effect on the stomach or bowels.

11. Concerning the size of the dose which is necessary to insure the action of sparteine, it was found that doses of .02 (about ⅓ grain) *per dosi* and .1 (1½ grains) *per die*, which, by Voigt, are called "medium doses," were too small. A far better action was observed when from the very outset doses of 1 decigramme (1½ grains) were given, and in some peculiar cases even as much as 2 decigrammes (3¾ grains) at a dose, and in a few special cases this dose was repeated several times during the day. In this respect the author agrees with Germain Sée, and also with H. Leo, who both advise .1 doses (1½ grains) several times a day, and who ordered 2 or more grammes of sparteine sulphate to be taken in two or three days.

Larger doses than this should, however, be used with the greatest possible caution, as it has been observed that when over a certain amount has been given the action of the drug was reversed, and caused a still greater irregularity of the heart's action than that which had existed before the drug was used. From this fact it was, however, seen that,—

12. This artificial irregularity ceases in eight to twelve hours, and the former state again supervenes, and now smaller doses of the drug may be given with the same effect as though the drug had never been used before. From this it may be justly inferred that,—

13. No accumulative effects of sparteine sulphate need be feared.

The author considers the use of the drug indicated in all cases of heart-trouble in which digitalis, which is still the reigning cardiac remedy, has been tried without avail, or when from some reason or other its use is abstained from, or when it is desired to regulate the heart's action in the soonest possible time.

Furthermore, the use of sparteine is of great value in stenocardiac attacks; it will give relief and good results even when the heart's action is seemingly unaffected by it.

Its diuretic action is also of great value. The author is still in doubt as to its accredited action in bronchial asthma, but, at any rate, it cannot be compared with other remedies which are used in that disease.—*Zeitschrift für Therapie*, Vienna, October 15, 1887.

THE VALUE OF CALOMEL IN CERTAIN DISEASES OF CHILDREN.

The careless and indiscriminate use of calomel properly leads to its condemnation as a remedy, but now that the cases in which its employment is indicated are being recognized with a greater clearness, we can recognize the great value of this remedy in diseases of children, especially if properly selected. Dr. George B. Fowler, in the *New York Medical Record* for November 19, 1887, refers to several affections common to children in which the greatest advantage may be expected from its employment.

Diarrhœas.—Diarrhœas in children are of varied severity, and may depend, in otherwise healthy individuals, upon several different causes,—over-feeding, improper feeding, dentition, and other nervous influences, atmospheric disturbances, and changes of temperature. Whatever the cause, the first thing to happen is an arrest of, or interference with, digestion. The food then begins to act as a mechanical irritant, or, ptomaines and poisonous gases being produced, as a chemical one, and diarrhœa ensues. Here calomel, given in $\frac{1}{6}$-grain doses, and combined with the bicarbonate of sodium and a little sugar, repeated every half-hour, until one-half or one grain, according to the age of the child, has been administered, will, in most cases, relieve the symptoms. Of course the diet must be carefully regulated, and it may be necessary, after the bowels have moved several times as an effect of the medicine, to administer small doses of Dover's powder at intervals of two or three hours,—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Dr. Fowler believes that the remedy in this affection acts both as a cathartic and antiseptic. It relieves congested mucous membrane, and, if there be vomiting, is almost unequalled in relieving that symptom. In entero-colitis

he proposes the same plan of treatment as in simple diarrhœa, and in cholera infantum, combined with stimulants and hot or cold water enemas, as the case requires, he has succeeded in obtaining excellent results.

In all the common *derangements of digestion* where slight diarrhœa may or may not alternate with constipation, and hard balls of pale fæces are voided, Dr. Fowler gives calomel in minute doses twice a week until the bowels are uniformly loose. Then he gradually reduces the frequency of the dose, and, finally, after about three weeks, stops it altogether. For peevishness, fretfulness, anorexia, accompanied or not with slight fever, calomel is the remedy.

For *intestinal worms* the author uses nothing but this agent. In fact, whenever he desires a cathartic effect he rarely employs any other medicine than this salt of mercury.

It has long been known that calomel caused an increase of the discharge of urine, and within a year or two several papers have appeared reviving the treatment and attempting to explain its action in this connection. The writer has employed it in two cases of *pleurisy* with the best results. The urine in both instances was markedly increased, and this, together with the slight catharsis, was effective in rapidly causing absorption of the fluid. It is certainly indicated in other dropsical conditions. It is safer and more active than digitalis and acetate of potassium, to say nothing of its preference as regards taste and ease of administration. In *pneumonias* of children, where there is danger from œdema of the lung, or suffocation from accumulated mucus, calomel demonstrates its diuretic and absorbent powers by relieving these conditions and averting the danger.

Dr. Fowler is likewise a strong advocate of the use of this salt in diphtheria, and believes that it is the best remedy there is to combat this dread affection with advantage. His experience with it in this disease has been so extraordinary, so incredible, having only lost two cases out of thirty, that we can scarcely endorse his eulogy of the drug in this disease. He claims for calomel that it is the best and most agreeable cathartic for children, and that it is an antiseptic and an effective diuretic; that all will admit.

THE OIL OF TURPENTINE IN DIPHTHERIA.

The value of this drug in diphtheria and similar diseases is beginning to be universally acknowledged, and the following results of the experiences of Dr. C. Roesse, of Hamburg, only serve to give further proof of its efficacy in this serious disease (*Therapeutische Monatshefte* for October, 1887):

During the past four years the author has treated sixty cases of diphtheria with the oil of turpentine, among which two patients were 1 year old, five were 2 years old, five were from 3 to 5 years old, ten were 6 years old, six were 7 to 9 years old, fifteen were 10 to 15 years old, ten were 16 to 20 years old, six were 20 to 30 years old, and only one patient was older than this.

Out of the sixty cases thus treated only five died. Two of these were the children aged 1 year, who were moribund when the author was called in, and died in the course of a few hours. Two of the other deaths were a little girl aged 2 and a lad aged 15. Both died after an illness of only thirty-six hours, which from the very outset had been of a most violent character. Both patients were well nourished and well cared for. The other death was that of a poorly-nourished boy, aged 15, who was also weak and poor-blooded; in him the disease lasted for five days.

Not counting the two first-named cases, there practically remains only three deaths in fifty-eight cases, which is about a death-rate of five per cent.

The oil of turpentine was given by the teaspoonful three times a day. As a corrective, Dr. Roesse used spiritus ætherus, 1 gramme (16 minims) of the spirits to every 15 grammes (4 drachms) of turpentine oil.

At the same time he gave a tablespoonful of a two per cent. solution of sodium salicylic. every two hours; also used ice-bags, and had the patient gargle frequently with a one per cent. solution of potassium chlor.

The following are the results of his observations:

1. The fever and the frequency of the pulse decreased rapidly.

2. The subjective difficulties, such as headache and difficulty in swallowing, were soon relieved.

3. The duration of the disease was greatly shortened.

4. The local symptoms ceased to grow worse in most cases as soon as the first dose of the drug had taken effect.

5. The danger of choking only occurred in one case,—viz., that of a boy 3 years old. Tracheotomy was performed, but this is the only case in which the operation was necessary.

The author abstained from painting the throat, as he contends that his experience has shown him that the practice is utterly valueless. Aside from this, the author remarks that he considers the private practice of patients painting their own throats as very unsafe, and should be carefully guarded against.

The oil of turpentine was used with the greatest possible caution in anæmic and decrepit cases, and patients with cardiac troubles.

In sound-hearted patients the increase of the heart's action was carefully watched. The author's patients were given strong bouillon or beef-tea, old port wine, and milk. The thirst was quenched with ice-water, with or without raspberry syrup.

The diet consisted only of the above-named fluids, no solid food of any kind being given.

Dr. Roesse stopped the use of turpentine oil so soon as the patient was free from fever and the local symptoms had improved. Usually 15 to 20 grammes (4 to 5 drachms) were sufficient, but in a few cases as much as 60 grammes (2 ounces) were given during the course of the disease.

The author states that he has never observed any signs of poisoning resulting from the use of turpentine oil.

Slight partial paralysis was once observed after the disease had left, but was speedily corrected by small doses of iodide.

A NEW METHOD OF EMPLOYING IODINE FOR ANTISEPTIC PURPOSES.

Antiseptic medicine—not merely preventive, but employing antiseptics as therapeutical agents in the treatment of disease, more especially of a zymotic type—is more and more becoming worthy of the attention of physicians. It will be frequently noticed that the remedies employed in the treatment of infectious diseases for the protection of those in attendance and for the prevention of the spread of infection often produce satisfactory changes in the conditions of the patients themselves. Thus, fumigation of the sick-room of a scarlet fever patient will often be attended with a marked diminution of the throat-symptoms, and with a perceptible decrease of pyrexia, restlessness, exhaustion. It appears to be tolerably well established that the most favorable period for the propagation and development of contagion is in the night-time; perhaps mainly because the sunlight is temporarily withdrawn, and, the house being closed against the free transmission of air, impurities from exhalations, excretions, and various other sources accumulate. Accepting this statement as correct, it occurred to Messrs. J. H. Cass and George Brownen (*Med. Press*, October 5, 1887) that if the materials employed for illuminating purposes in the night could be utilized for the evolution of a disinfectant, a useful preventive of contagion would be obtained. Koch came to the conclusion that the only effective disinfectants besides chlorine, bromine, and iodine are corrosive sublimate, osmic acid, and potassic permanganate.

We must necessarily exclude the mercurial sublimate from our consideration. Valuable, perhaps the most valuable, as it is among antiseptics for local surgical application, its highly poisonous character forbids its employment as a general medicinal disinfectant. Osmic acid and bromine are too expensive for general use, and the offensive odor of the latter would also militate against its employment. Chlorine has the same objections from the disagreeable pungency of its vapor. The potassic permanganate is also comparatively valueless unless employed in considerable strength. Iodine, however, presents none of these disadvantages. It has long been recognized by all authorities as a true germicide disinfectant. Iodoform, which acts by the gradual and continued liberation of free iodine, is now almost universally employed in the surgical application of antisepsis. The deodorizing properties of iodine have been long known, and although it has for very many years been employed for that purpose in the cancer-wards of the Middlesex Hospital, and probably in many other similar institutions, its employment as a general disinfectant has been greatly lessened, owing to the difficulties experienced in its regular and gradual vaporization. Combined, however, with salicylic acid, we find that it can be readily and permanently incorporated with fats, paraffins, or wax, and when candles made from these hydrocarbons thus treated are ignited iodine and phenol are evolved in a gaseous vaporized form. The phenol is produced by the decomposition of the salicylic acid, and its amount varies according to the temperature or rate of the combustion. Its presence may be verified by passing the vapors of the combustion through dilute nitric acid, and thus producing trinitrophenol or picric acid. But where the combustion is

rapid and complete the phenol is entirely destroyed, as all other *organic* materials, such as eucalyptus, which has been suggested for somewhat similar treatment, must necessarily be. It is not so, however, with regard to the iodine. Being *inorganic*, it is wholly volatilized and thrown out as vapor into the surrounding atmosphere, but it is in no sense destroyed. Its presence in the gaseous products of the combustion may be demonstrated by passing them through a solution of starch, or along a tube moistened with starch-mucilage. In either case the iodide of starch is speedily produced, and may be recognized by the usual tests. A very faint odor of iodine may be detected when these candles have been burnt in quantity in a close atmosphere; but this is never unpleasant, or in the least degree irritable to breathe; indeed, in several cases of asthma, spasmodic cough, and "hay-catarrh," the patients have experienced great relief from the iodine-vapor thus liberated. As a deodorizer its action is most marked; the smell of tobacco-smoke is quickly and entirely destroyed by the combustion of these candles in the smoking-room. The air of stuffy rooms and smelling closets may be rapidly purified by the same means. The odors of sulphuretted hydrogen and of ammoniacal air from a close stable have been very speedily and completely discharged by contact with the same vapor.

NOTES ON ANTIFEBRIN.

The following interesting notes on antifebrin by PROF. A. BOKAI are the results of the labors of the institute for experimental pathology of Klausenburg. They were published in the *Deutsche Medicinische Wochenschrift* for October 20, 1887, and will be of special interest to pharmacologists, as they treat mostly of the pharmacodynamics of antifebrin.

1. Antifebrin kills infusoriæ. A .5 per cent. watery solution of the drug will in a few minntes stop the movements of balantides and opalines, also of flagellates; and in fifteen minutes to a half-hour all these micro-organisms will have completely lost their motive-power. The infusoriæ of a simple infusion of hay are killed with even greater rapidity; the flagellates are here also the last to die. Antipyrin does not act any more powerfully on infusoriæ than antifebrin; the salts of thallin are more active, but the most energetic of all of these new antipyretics in this respect is kairin.

2. The moving bacteriæ (spirilli and bacilli) of an infusion of hay retain life and continue to move in a .5 per cent. solution of antifebrin as long as three hours. The anti-zymotic action of the drug which is claimed by Krieger, Cahn, and Hepp cannot possibly be very energetic.

3. A .5 per cent. (indeed, even a .25 per cent.) solution of antifebrin will stop the protoplasmic movements of the amœbæ in an infusion of hay in four or five minutes.

4. The amœbic movements of the colorless blood-corpuscles of rabbits cease in four to six minutes when placed in .5 per cent. solution of antifebrin containing .6 per cent. of common salt; the same result may be obtained by a .25 per cent. solution.

5. The red blood-corpuscles of man, rabbit, dog, and frog dissolve in a .5 per cent. solution of antifebrin containing .6 per cent. of salt.

When examining the solution in which the red blood-corpuscles had been dissolved (by means of the microspectroscope) it was observed that the characteristic absorption stripes or lines of methæmaglobin in the red portion of the spectrum were absent.

6. A similar salty .5 per cent. solution of antifebrin will paralyze the motoric nerve-ends of the muscles of a frog in the same manner as curare. After continued influence the striped muscular fibres lose their power of contraction entirely. The nerve-centres are not excited or affected by the above solution.

A fatal dose of antifebrin will render a rabbit helpless in five minutes; in ten to fifteen minutes convulsive twitchings begin, and the respiration becomes more and more slow and labored. If an electric current be applied directly to the muscles even an hour and a half or two hours after the drug has been administered, they will contract actively; if, however, the current is brought in contact with the motor nerves, only slight contraction will take place. At the moment of death the muscles will still contract strongly when the electric current is applied directly to them; the motor nerves, however, show no reaction.

7. Toxic, but not fatal, doses of antifebrin irritate the vaso-constrictor centre of the spinal cord and paralyze it.

8. The cyanosis, which is very great when fatal doses of antifebrin have been given, results principally from the effects of the poison on the respiratory organs; which may be explained, firstly, by a paralysis of the motor nerve-ends of the respiratory muscles; and, secondly, by a probable paralysis of

the respiratory centre in the medulla oblongata. The cause of the cyanosis in animals should never be sought in the formation of methæmaglobin, as even when the largest doses of the drug were given neither before nor after death was methæmaglobin traced in the blood. It may be added that methæmaglobin was, however, found in the blood of a dog when under the influence of doses of antifebrin which were not fatal. It is very possible that in these animals (canines) the cyanosis is accompanied by the formation of methæmaglobin, yet only accompanied and not caused by it, as also in dogs the respiratory functions are always impaired by antifebrin, even when given in only slightly toxic doses. The author is of the opinion that the cyanosis observed in man is caused by vascular spasm.

9. Antifebrin does not seem to have any effect on the brain, although it appears to affect the sensitive elements of the spinal cord. Professor Bokai asserts the above, as he has observed that in rabbits poisoned with the drug when they are still able to voluntarily move their extremities, reflex movements were impossible. The animal did not move when its tail (otherwise so sensitive) was pinched, and did not squeak when the ischiatic nerve was severed.

10. The power antifebrin has of reducing the heat of the body when given in non-toxic doses is due to its property of lessening the production of heat.

In toxic doses this is increased by the vascular paralysis ; in man it is accompanied by perspiration. The author's assertion that antipyrin lessens the production of heat is sustained by the fact that the motor nerve-ends of the muscles, and also the muscles themselves, are paralyzed by the drug. Professor Bokai does not consider that total paralysis of the motor nerve-ends is necessary for the lessening of the production of heat, but holds that their partial paralysis or paresis is sufficient to hinder its production.

Such a paresis must, therefore, take place in man, when, upon taking large doses of the drug, the temperature falls with such marked rapidity.

The presence of paresis is noticeable in the weakness, adynamia, and tired feeling about which most patients who are taking antifebrin constantly complain.

In those cases of antifebrin-poisoning where, in the blood of a man or dog, methæmaglobin is found, there can be no doubt that this also will lessen the production of heat to a marked extent. Further, the power antifebrin has of dissolving the red blood-corpuscles, if (as is not unlikely) this could take place in living blood, would undoubtedly also tend to lessen the production of heat.

Still another point should be mentioned which has led the author to the conclusion that antifebrin has the above property.

Toxic, but not fatal, doses of antifebrin, when given to a rabbit, cause a spasm or contraction of the cutaneous vessels (medicinal doses have a similar effect on a man) ; this lessens the giving out of heat through the skin ; still, in spite of this, in a short time (both in rabbits and man) the central (rectal) temperature will be reduced. We must now also take into consideration the fact that antifebrin has little or no effect on the heart, and so in this case the fall of temperature is clearly due to the lessening of the production of heat.

That this is really the case will be made apparent by the following brief account of two of the author's experiments :

A dog was put under the influence of tincture of opium (per venam) and then tied down by his four legs in a room the temperature of which was 20° to 23° C. Professor Bokai then placed a thermometer under the skin of the lower part of one of the hind legs, and placed another between the muscles of the other hind leg, and still another in the rectum. After the normal temperature as indicated by each thermometer had been carefully determined, the author introduced into the stomach of the dog a large, although not fatal, dose of antifebrin, and for the next four hours proceeded to carefully record every change of temperature of each thermometer. The table which he had thus procured he carefully compared with another table of the temperature of a canine which had been similarly prepared, but which had not been given antifebrin. The comparison showed that in the animal which had not been treated with antifebrin the temperature under the skin sank 4.2° C. in four hours, the temperature between the muscles sank 2.3° C., and in the rectum 2.1° C., while in the dog that had been given antifebrin the temperature under the skin sank 4.4° C., in the muscles it sank 4.5° C., and in the rectum 4.6° C. It will be observed that in both animals the fall of the temperature under the skin was nearly uniform ; the temperature of the muscles, however, sank 2.2° C. lower in the animal treated with the drug, and the temperature of the rectum of the same animal

2.5° C. lower in a like period than in the dog that had not been given the drug.

Should the temperature of the skin after a time have indicated a rise, then the great reduction of internal temperature could be easily explained by the giving out of heat through the skin. As this was not the case, and especially as we observed such a rapid fall of temperature, the cause can only be explained by the lessening of the production of heat in the muscles.

Finally, the author concludes by stating that a student in his institute, Mr. Emanuel Deutsch (*Cand. Med.*), has been making a series of experiments relative to the effect of antifebrin on the nitrogen contained in the urine, and has found, as might have been expected, that antifebrin has the power of greatly decreasing the quantity of nitrogen in the urine. Mr. E. Deutsch is working according to the "Kjeldahl" method, and his observations will be shortly published.

ARSENICAL PIGMENTATION IN PEMPHIGUS.

At a recent meeting of the Clinical Society of London, Dr. Hanford reported a case of pemphigus occurring in a child aged 13, and terminating in complete recovery after nearly a year (*Medical Press*, October 19, 1887). The limbs, trunk (except parts of chest and abdomen), face, tongue, mouth, pharynx, mucous membrane of nose, conjunctivæ, and orifice of the vagina were all affected. The eruption came out in crops, and was accompanied by rise of temperature. Micro-organisms were found in the bullæ which contained pus, but not in those which contained serum. Quinine in large doses was given with benefit, and arsenic. Of the latter, 15-minim doses of Fowler's solution were given thrice daily, and continued for ten weeks. After this, the skin of the whole body was noticed to be dry, brawny, and darkened in color. The axilla, groins, and abdomen were almost as dark as in Addison's disease. The skin looked dirty, but the color was proved to be due to pigment, deposited chiefly in the rete, but partly in the more superficial epithelium. The arsenic was stopped, and the patient treated by wet-packing, and in a month the skin had resumed its normal, smooth, moist appearance, and much of the pigmentation had disappeared. Also on the hands and feet there were many elongated patches of cicatricial-looking skin, thickened and elevated. These patches were covered with white points, like millet-seeds, just beneath the epithelium, and resembling, to the naked eye, miliary tubercles. They were not tubercular, but consisted of accumulations of degenerating epithelial cells in the deeper part of the epidermis. They disappeared in four or five months. It is possible that this condition also was due to the arsenic. Several colored drawings and photographs illustrating these conditions were exhibited. A third case of pemphigus was described, in which there was some ground for suspecting implication of the mucous membrane of the intestinal canal. It presented also the atrophied glossy condition of the skin of the hands mentioned in the first case, and which is so suggestive of an implication of the peripheral nerves. No definite affection of sensation or of the reflexes, however, could be discovered, though reference was made to the statement of Dr. Pasquale Ferraro that he had found advanced changes of an atrophic degenerative nature in the posterior horns of the dorsal spinal cord, and also in the peripheral nerves, the ganglia on the posterior nerve-roots, and in the sympathetic ganglia. Two further instances of arsenical pigmentation were narrated, and the opinion was expressed that small doses of arsenic—mv, or mx—of the liq. arsenicalis repeated thrice daily for about two months were capable of producing a pigmentation of the skin, chiefly of the abdomen, lower part of chest, lumbar region of the back, axilla, groins, and inner part of the thighs. This condition was not necessarily accompanied by roughness and dryness of the skin, and disappeared slowly in from one to four months, or rather longer.

Dr. Crocker, referring to the pigmentation of the skin, said that this was fairly common on the site of eruption, as a result of the treatment of psoriasis by arsenic. General pigmentation, however, was less common, but did, nevertheless, occur from time to time. He had then under his care a boy with a bullous erythema, which he was treating by arsenic. Latterly the boy's skin had become pigmented. He thought it should be generally known that pigmentation was likely to follow prolonged treatment with arsenic, quite independently of the eruption. It was probably due to a deposit of the metal itself in the skin. The pigmentation lasted a very considerable time, much longer than four months, as mentioned by the reader of the paper.

Dr. Goodhart took up the question of

fever mentioned by the reader of the paper, he having a case now under his notice, in a little girl, in which high fever occasionally occurred. He said that this case showed very plainly the peculiar property of arsenic to control the disease, though not to cure it. In this case the dose of arsenic required to subdue the eruption was so high that it could not be continued, and then the eruption recurred.

SIR DYCE DUCKWORTH wished to add his testimony as to the value of arsenic in the treatment of pemphigus. He had formerly been sceptical as to the benefits claimed for its use, but had more recently had ample proof of its efficacy, several cases having been apparently quite cured thereby. In one of these cases marked pigmentation had followed the use of 12 minims of arsenical solution three times a day.

THE ACTION OF CHLORIDE OF ETHYLENE ON THE CORNEA.

In the *France Médicale* of July 5, 1887 (*London Med. Record*, October 15, 1887), MM. R. DUBOIS and L. ROUX publish the results of their researches on the action of chloride of ethylene on the cornea, which was the subject of a communication to the Academy of Science.

The interest of these researches lies principally in the very experimental opacification of both corneas, under influence of an agent administered through the respiratory organs. The animals experimented upon were dogs, that were made to inhale the vapors of chloride of ethylene for one hour and a half. The eyes presented nothing particular, except a considerable diminution of intraocular pressure and an irregular astigmatism already noticed by M. Dubois in prolonged action from chloroform-anæsthesia. With anæsthesia by chloride of ethylene these modifications are much more apparent.

The cornea remains transparent as long as the inhalation continues, and afterwards as long as the animal throws off by the lungs the anæsthetic. But after from sixteen to eighteen hours, sometimes less, the two corneas lose their transparency, take a bluish opalescent tint, and give a peculiar expression to the animal. On the two dogs in question this strange effect took place during the night, and was first observed in the morning on their awakening. No other disturbances were observable. The inhalator had been so arranged that the anæsthetic vapors could have no direct contact with the eye.

One of the animals was killed, the other kept under observation for a fortnight. Both presented the same symptoms. In the living dog the tension of the eyeball was still considerable, although less than the first days. The maximum of intraocular tension was attained at the moment of the production of the corneal opacity.

The curvature of the cornea was evidently exaggerated, principally along the vertical meridian, causing a regular astigmatism, easily appreciable with the disk of Placido. At the moment the opacity of the cornea was first noticed there was no trace of irregular astigmatism; the surface of the cornea had preserved its polish, but examined through a magnifying-glass, very numerous minute depressions were observable all over it. The general aspect is that of total anterior staphyloma, opaque and symmetrical in both eyes. Vision subsists, but is rather dimmed by the opalescence of the cornea. The ophthalmoscope shows that the crystalline lens is still transparent, but the details of the back of the eye are not distinguishable. The oculo-pupillar reflex is retained, and also the oculo-palpebral reflex. The sensitiveness of the cornea and of the retina did not appear to have been affected. For the last two days there is amelioration in the state of the cornea. At the outset the opacity was uniform, but at present, under the ophthalmoscope, with a strong light, numerous whitish arborisations are discernible, the direction of which radiates from the periphery towards the centre.

The experiments of M. Ranvier at the Collège de France on the cornea of animals used for experimentation having shown that the cornea may lose its transparency when subjected to pressure, it is not impossible that the variations of intraocular pressure noticed may be the cause of the opacity produced in the living animal. The question arises whether in this case it is not a dishydration of the cornea, more particularly of certain constituent elements of that membrane, the more so that M. R. Dubois has already proved the powerful dishydrating action of anæsthetic vapors on animal and vegetable tissues What seems to confirm this view is the remarkable loss of weight of the animals experimented upon, unexplainable by an increase of the phenomena of assimilation or by refusal of food. These observations are most interesting, and augment the list of those so little understood accidents which so

suddenly supervene at the moment when the economy is getting rid of poison, and which differ so entirely from those produced by the penetration of the poison into the system.

USTILAGO MAYDIS AS AN OXYTOCIC.

During the months of May to August, 1887, DR. W. A. N. DORLAND, while serving as a resident obstetrician in the Philadelphia Hospital, tested the efficiency of ustilago in those cases in which the parturient pains had almost or entirely died away during the second stage of labor, and he reports nine cases in the *Medical News* for November 5, 1887, grouping his conclusions from them as follows:

1. *The toxicology and physiological action of the drug.*

No cases of poisoning in man by the drug are on record. That it is, however, possessed of toxic properties in large doses has been proved by Mitchell. (See THERAPEUTIC GAZETTE, 1886, p. 223.) He found that in the lower animals, in large doses, it acted violently upon the spinal cord, paralyzing first the sensory, later the motor, tracts, finally involving the motor and probably also the sensory nerves. Like ergot, then, it is probable that the chief force of the drug, in toxic doses, is expended on the nerve-centres, producing a toxic paralysis.

After the administration of the drug in three instances, there was considerable nausea, followed by vomiting of the ustilago, together with the other contents of the stomach. This nausea seems to be of a similar character to that produced by the ergot of rye, and calls for no further discussion.

The action of ustilago upon the uterus has been more carefully noted. After the ingestion of a sufficient amount, in from twenty minutes to half an hour, the pains, if present, are increased in severity, in frequency, and in duration, presenting a marked clonic character, following each other in frequent succession, with a decided intermission between each. In this respect it differs decidedly from the action of ergot, which, in full doses, produces one continuous, *tonic* spasm of the uterine muscle. It is this property of ergot which has, when administered before the delivery of the placenta, produced in so many instances the irregular contractions of the uterus, of which the hour-glass is a well-known example. The employment of ustilago seems to be entirely free from such unpleasant complications.

In addition to being a valuable adjuvant in stimulating weak uterine contractions, ustilago seems to possess the property which some years ago was ascribed to quinine,—namely, of exciting uterine pains when entirely suspended. This has been noticed by Leonard and others.

As to the time required for the action of the drug to become apparent, it may be said that it differs in different cases, depending, undoubtedly, upon the rapidity with which it is absorbed from the gastro-intestinal tract and carried into the system. In the above record, in only two instances did it require over thirty-five minutes before the ustilago acted upon the uterine tissues, and in the latter case it will be remembered that most of the drug was ejected by emesis. In the remaining seven cases the average time required was twenty-five minutes.

The effect produced by ustilago upon the other unstriped muscular tissues of the body has not been inquired into. Probably it produces the same increase of intestinal peristalsis and the same rise in the arterial pressure, due to vaso-motor spasm, as is produced by ergot. This is yet open to investigation.

2. *The indications for the employment of the drug.*

It may be noticed that in all the above cases the ustilago was not administered until complete dilatation of the os had been accomplished. Whether or not a disastrous effect would be produced by the administration of the drug prior to the commencement of the second stage of labor cannot be stated. As yet, that question has not been decided. From the study of the physiological action of ustilago, it would appear that all danger of the irregular contractions of its compeer, the ergot of rye, would be precluded, and that if there were any possibilities of the exigencies of the case demanding its use, it might be employed with impunity during the first stage of labor. At present, however, it seems that the first indication for its use is the failure of the pains, with *complete dilatation of the os uteri.*

In none of the cases was the drug employed until the pains of labor had either become so weak that they were inefficient to accomplish the expulsion of the fœtus, or until they were entirely suspended. This, then, the author considers the second indication for its use,—namely, the *inefficiency or entire suspension of the parturient pains.*

After the ustilago had been taken, it may also be noticed that in no case was there the slightest tendency towards a post-partum hemorrhage. In each case, after the expulsion of the placenta, the uterus remained in a state of firm contraction. While during the three months the great majority of the remaining cases, in which the customary ergot had been employed, showed no tendency whatever towards this alarming accident, however, in two instances was there such an occurrence demanding prompt attention. The third indication, then, for the employment of ustilago is claimed to be *a condition of uterine inertia threatening or producing post partum hemorrhage.*

3. *The dose and mode of administration.*

The preparation of ustilago employed in all reported cases was a good fluid extract. The dose of this varies from ½ to 2 drachms, 1 drachm being a fair average. This may be repeated at intervals, as required. Should it be necessary, it may be used hypodermically, in doses of from 5 to 15 minims.

Finally. *The advantages of ustilago over ergot.*

Dr. Frank H. Potter, in a paper on the "Proper Use of Ergot in Obstetrical Prac tice," closes his article with a series of ten conclusions. In these he states that when administered during labor the action of ergot is uncertain, producing irregular contractions, rigidity of the os, with interference of the placental circulation, or too rapid expulsion of the fœtus, jeopardizing the maternal tissues. He also asserts that the life of the child is endangered through absorption of the oil of ergot, and that indirectly the drug may prove a cause of puerperal septicæmia by preventing the removal of every portion of the placenta and membranes. His last conclusion is as follows: "The proper use of ergot in obstetrical practice is limited to those cases in which, after the expulsion of the placenta, the uterus refuses to contract, or, having once contracted, shows a tendency to secondary relaxation. Even in these cases reliance should not be placed upon it alone, but its action should be supplemented by the other means used to provoke uterine contraction."

When compared to this formidable array of objections, the employment of ustilago seems much to be preferred to that of ergot. It does not produce irregular contractions, with all the consequent complications and sequelæ; containing but two and a half per cent. of fixed oil, while ergot contains from twenty-five per cent. to twenty-eight per cent., the dangers of absorption are reduced to a minimum; and, finally, as it can be procured at a cost of fifty per cent. less than that of ergot, it seems to be on a fair highway towards the supplanting of the latter in obstetrical practice, should the results of the investigations thus far be confirmed by subsequent researches.

THE SURGICAL TREATMENT OF PERITONITIS.

The propriety and value of surgical intervention in the treatment of certain forms of peritonitis formed the main subject discussed at a late meeting of the London Clinical Society. The cases which gave rise to the debate belonged to two different categories, and perhaps for that reason the discussion was rather involved. It may therefore be convenient to analyze it on each head. In his successful case of acute suppurative peritonitis, MR. BARWELL was pursuing the practice which was brought before the notice of the Royal Medical and Chirurgical Society by Mr. Treves and Mr. Marsh two years ago, giving rise to an interesting debate on the occasion. For although, as Mr. Barwell said, the priority in conception of this procedure rests with the late Mr. Hancock, the operation itself, with the deliberate intent of treating the peritoneal condition, was first performed by Mr. Treves. It may now be considered not only a legitimate but a very valuable means of treatment, and one which is sure to become more widely practised. Mr. Barwell's case was also instructive, as the President pointed out, on account of the large accumulation of gas present within the abdominal cavity; which makes it more than likely that the peritonitis had been excited by a perforation of the bowel, perhaps of the vermiform appendix. General peritonitis due to perforation is almost invariably fatal, so that physicians may be justified in having early recourse to the aid of the surgeon, who by incision and drainage can promise a more favorable issue. As to the *technique* of the operation, nothing can be simpler, and it was clearly shown that no better medium for washing out the cavity could be employed than pure water, provided this were supplied in sufficient amount, and the irrigation were as thorough as possible. At the Clinical Society more attention was bestowed upon the subject of tubercular peritonitis, the two cases furnished by DR. KNAGGS and MR. CLARKE, of Huddersfield, forming

the chief topic of the debate. Here we may remark how deep-rooted is the notion that tubercular disease of a serous membrane like the peritoneum is necessarily fatal, and the impression conveyed by Dr. Burney Yeo's questions was certainly to that effect. We may refer all those who still hold to this opinion to a clinical lecture on "Tubercular Peritonitis in Children," by Dr. Gee, published six years ago (*The Lancet*, January 1, 1881), and his statement that "recovery from tubercular peritonitis is common" will be endorsed by physicians who practise in children's diseases. In adults cases of recovery from this disease are less common, but Sir Spencer Wells's celebrated case is a standing refutation of the prevalent pessimistic views which would regard tubercular peritonitis as being as hopeless as cancerous. The debate, however, did good service not only in correcting this impression, but in showing how materially recovery is aided by draining the cavity of its contained fluid. Here, again, a lesson may be learned from the practice often adopted in the case of children with considerable success,—viz., simple paracentesis. Whether irrigation and continuous drainage is superior to paracentesis, which may have to be repeated, experience alone will show; but that the essential thing is to withdraw the fluid so as to allow the affected serous surfaces to come into contact was strikingly brought out in the report which Mr. Treves gave of the recently recorded experience of German surgeons. The measure of success obtained did not seem influenced by the adoption of various methods; the essential point was that the peritoneal sac should be laid open. It would thus appear (as was suggested in the debate) as if the effused fluid were itself a source of danger; but that it is absolutely necessary to "alter the character of the inflammation" by the injection of iodine, carbolic acid, or other irritants is still an open question. Dr. Knaggs and Mr. Clarke are to be congratulated on the result of their bold treatment, which may well be adopted in similar cases uncomplicated by active tubercular disease of the lung or ulceration of intestines. Such cases in the adult are not so very common, and their diagnosis is not always simple; but that the local tubercular process may be quite arrested and the general condition of the patient vastly improved by local drainage (aided, of course, as Mr. Parker pointed out, by general treatment) has been amply shown.—*The Lancet*, November 5, 1887.

EGYPTIAN TAMARIND FOR HEMORRHOIDS.

In the *Medical and Surgical Reporter* for November 12, 1887, Dr. J. C. Brobst calls attention to the use of Egyptian tamarind for bleeding hemorrhoids, and states that in his practice he has had most extraordinary demonstration of its curative powers in many cases which had been by others deemed incurable. He employed the decoction of the tamarind flower in doses of 3 or 4 wineglassfuls, but unfortunately, however, he does not give the quantity of the drug used for making this preparation. After the use of this drug he states that the itching and burning become gradually relieved, and where the affection is complicated, as it usually is, with constipation and a loss of appetite, the good results are especially marked.

NOTES ON THE PHYSIOLOGICAL AND THERAPEUTICAL ACTIONS OF SOLANIN.

According to Clarus, solanin is a narcotic poison which has the property of paralyzing the spinal cord and vagus endings, and of exciting the peripheric nerves.

In former years Geneuil experimented with the drug, and came to the conclusion that solanin exerted its narcotic properties on the medulla oblongata, spinal cord, and nerve-branches, and thereby caused a paralysis of the extremities and of the sensitive and motoric nerves.

Capparoni had recently conducted a series of experiments with solanin on man. His results are as follows:

A very small dose of solanin (.10 grm. = 1.54 grains) will cause (especially in individuals with a sensitive stomach) a sensation of burning in the stomach, salivation, and nausea. All these symptoms prove that the drug causes a local irritation. When the drug is given where the stomach has been previously anæsthetized, or when it is administered hypodermically, this irritation does not take place.

The same dose causes a lessening of the pulse's frequency and of the respirations, and a decrease of the reflex activity of the excito-motor tendency of the spinal cord and medulla oblongata.

Solanin does not seem to have any influence on the brain-centres; it is not a hypnotic; the pupils do not undergo any change.

In the circulatory system small doses of solanin lessen the rapidity of the heart's ac-

tion and increase the pressure of blood in the arteries.

Toxic doses, however, cause the pulse to increase greatly, and lessen the arterial pressure, and also increase the respirations. Solanin is thrown off by the kidneys, but has no effect on the secretion of urine, neither is it a diaphoretic.

As to its therapeutical actions, the author has found it of great value in cases where it was necessary to reduce the irritability of the spinal cord; also in asthma, in difficulties in walking, and muscular spasms of a peripheric origin, in tremor, etc.

The author usually gave .15 to .30 grm. ($2\frac{1}{3}$ to $4\frac{3}{5}$ grains) daily, divided into a lesser or greater number of doses, according to the special needs of the case.—*Zeitschrift für Therapie*, Vienna, October 15, 1887.

AN ANÆSTHETIC COMBINATION OF CHLOROFORM AND OXYGEN.

In a recently published paper on oxygen in chloroform-narcosis, Dr. Kreutzmann, of San Francisco (*London Med. Record*, October 15, 1887), states that the use of a mixture of oxygen and chloroform for anæsthetic purposes was first recommended by Neudörfer, of Vienna, who anticipated that such a mixture would, on inhalation, cause speedy insensibility without excitement, and be absolutely safe and free from the bad results of the ordinary anæsthetic agents. This recommendation, although Neudörfer's first trial was attended with the best results, has not been followed in consequence of certain difficulties in obtaining by the original method the required mixture of gas and chloroform vapor. Kreutzmann has given up all endeavor to supply the chloroform in fixed doses according to Neudörfer's directions, and now, in order to administer the mixture in an efficient manner, he attaches, with the intervention of an exhausting pump, an elastic bag containing oxygen to Junker's chloroform apparatus. In this way oxygen in the place of atmospheric air is pumped through the chloroform, and the patient inhales oxygen impregnated with chloroform vapor. It is pointed out that some air is taken in at the same time, as it is impossible to exclude this by the mouth-piece.

Dr. Kreutzmann speaks very favorably of the results obtained from the use of this mixture in twenty-three operations of different kinds, performed by Dr. Morse, of San Francisco, on patients of both sexes and varying in age from seven to fifty-six years. In every instance the anæsthetic acted with extreme rapidity, and repeatedly after a few deep inspirations such a degree of anæsthesia was attained that pain was no longer felt, although reflex action was still maintained. In cases in which deeper narcosis was required further administration of the mixture always removed any tendency to struggling. Children and young subjects were rendered insensible in a remarkably short time, but with drinkers the administration lasted longer. In not a single case was any marked excitement observed. With slight anæsthesia no change took place in the pulse and respiration. In instances of deep narcosis the respirations were accelerated and the pulse-frequency was diminished. In many patients the face became congested and covered by perspiration. After a state of incomplete anæsthesia the patient "came to" at once when the inhalation of the mixture had been arrested, and after a more prolonged and deeper narcosis there was for some time a quiet sleep, which, however, did not resemble in any way the deep coma observed after the administration of ether or of pure chloroform. Invariably the patient in recovering from the effects of the anæsthetic became conscious at once, and did not suffer subsequently from headache, vomiting, or nausea. Whether death from chloroform may be avoided by practising this mode of administration remains to be determined by further and more extended experience, but the small quantity of chloroform that is thus used, and the almost complete absence of any subsequent bad effects, permit us, Dr. Kreutzmann thinks, to entertain the best hopes in this respect.

HYDROGEN SULPHIDE IN ASTHMA AND CHRONIC BRONCHITIS.

Dr. Battesti (*London Med. Record*, October 15, 1887) has experimented upon patients affected with chronic bronchitis and asthma. He finds that his patients, after absorbing during three months, twice a day, monosulphide of sodium, have experienced neither the least disgust nor slightest irritation of the stomach. He proceeds as follows: Lehmann having shown that the absorption of carbonic acid by the stomach is easier when fasting, Dr. Battesti prescribes the ingestion of sulphurous water fasting, or four hours after meals. In order to avoid repugnance he uses the following formula: Monosulphide of sodium, 1

gramme; distilled water, 500 grammes. One teaspoonful of this solution contains one centigramme of the monosulphide, and he gives 1 or 2 spoonfuls a day, according to the toleration by the patient, which is equivalent to about one litre of Eaux Bonnes water. Calculations based on the chemical equivalents of monosulphide of sodium and of carbonic acid show that one-quarter of a litre of this gas is sufficient to entirely decompose one gramme of monosulphide. The patient, therefore, takes 1 teaspoonful of the sulphurous solution, and immediately afterwards 1 soupspoonful of Rivière's potion, or a glass of seltzer water. Rivière's potion is preferable on account of its lesser volume. Dr. Battesti has obtained the best results with this treatment, without its producing any disgust or irritation to the patient.

Reviews.

TEXT-BOOK OF THERAPEUTICS AND MATERIA MEDICA. By Robert T. Edes, A.B., M.D.
Philadelphia: Lea Brothers & Co., 1887.

When it was announced that a new work on therapeutics was about to appear from the pen of Professor Edes, we looked forward with much eagerness to the expected addition of a new American classic to the already long list of therapeutic treatises, and thought that perchance the well-known volumes of Bartholow and of Wood would be superseded by a fresher and more learned rival. The eagle seems, however, this time to have plumed its feathers for a very lowly flight, and instead of a classic, we are astonished to find that the late professor of Harvard University has written a small book which bears the same relation to a full treatise on therapeutics that a two years' medical course does to a three or four years' curriculum. The work is a sort of primer of the subject, which may be useful for students to cram from, but can be of but little value to any one who desires to thoroughly study the most important of all the branches of the science and art of medicine. Perhaps we can convey our idea of the aims of the book by stating that it should be classed as a modern representative of Biddle's Materia Medica and of Neill and Smith's Compend of a still earlier generation. Of course a reviewer cannot be expected to waste time in reading through an elementary book like the present. He is justified in taking out a few articles and from them judging the rest. We primarily selected the article on digitalis as a specimen article. We find that the whole subject of physiological action and therapeutic use of this remedy is discussed in about a page and three-quarters, and even the terse, dogmatic statement of effects in this article is so out of concord with the teaching of most leading physiological therapeutists of the day, that it is of the highest importance that the author should elaborate the page or two into a long article and demonstrate the correctness of his views. That "digitalis finally causes the paralysis or exhaustion of the heart and of the vaso-motor system and death by paralysis of all cardiac nerves," is certainly open to challenge. The statement, "The change from the strong to the weak pulse may take place suddenly, especially on exertion. This is spoken of as the cumulative action. It does not, however, imply any actual accumulation of the drug in the body," is also at variance with our own experience and with the teachings, we think, of other therapeutists of authority. The so-called cumulative action of the drug is not the sudden change from the strong to the weak pulse, and does, to our thinking, apply an actual accumulation of the drug in the body. As an instance of what is really meant by the cumulative action we may cite a case from our experience of a patient with excessive effusion in the pleura who had been taking digitalis for some weeks without sensible effect, when one morning the pulse suddenly dropped from about 90 to 70; the next day the pulse was 60, then 50, then 40, the beats remaining strong and full. This sudden excessive action almost invariably develops when there has been no diuretic action of the drug, and is not rarely seen after tapping for ascites when digitalis has been previously given steadily for a length of time. Under these circumstances the obvious explanation is that the digitalis has been long in the serum throughout the body, and that the withdrawal of large quantities of the fluid from the abdomen by tapping, and the consequent removal of the pressure from the outside of the blood-vessels, causes a relaxation of those blood-vessels, which is followed by a rapid absorption of serum with its load of digitalis, so that at once a very large amount of the poison is precipitated upon the heart. We also notice in this article on digitalis the statement that "the digitalin of the last edition of the Pharmacopœia," etc. There is no such thing as the digitalin of the last edition of the Pharmacopœia, this preparation having been dropped out at the last revision.

There is such a demand for short-cuts to knowledge in America and for cram-books that we have no doubt the work of Dr. Edes will sell, but we do not think that it will add to its author's reputation.

SEXUAL IMPOTENCE IN THE MALE AND FEMALE. By Wm. A. Hammond, M.D., etc.
Detroit, Mich.: Geo. S. Davis, 1887.

The history of human depravity is by no means pleasant reading, but, perhaps, it is necessary to the understanding of certain cases, if their cure is to be sought. Perhaps, too, a writer dealing with such topics is all the better for the absence of prudery, and a business, matter-of-fact manner. Still, if ever a book deserved the seclusion of lock and key this production certainly does. The histories, as given by Dr. Hammond, are certainly graphic, and his devices for the cure or amelioration of these moral monsters are ingenious; but the thought cannot but arise whether it is worth while to attempt any relief for some of them, and whether the physician who aids them in avoiding nature's relentless punishment is not condoning crime and almost an accessory after the fact. The book is easily written, and admirers of "Lal" will recognize the author's characteristic style more readily here than perhaps in more erudite works like his treatise on nervous diseases. Some valuable ideas, too, can be gathered from these pages, which tend in the direction of rational treatment, and the adaptation of special means and special ingenuity to special cases, for Dr. Hammond follows no beaten track if he knows it. From what we have said above, the reader may infer that "sexual impotence" is by no means a work for promiscuous reading; in fact, it is about the most dangerous one for such a purpose with which we are acquainted. This, however, is inseparable from the nature of the task that the author has undertaken, and we commend the work to those whose special pursuits lie in the direction of those diseases and conditions which nature has entailed upon the vicious for the best of purposes, and which man should not entirely relieve even if he could. E. W. W.

THE DETERMINATION OF THE NECESSITY FOR WEARING GLASSES. By D. B. St. John Roosa, M.D., LL.D., etc. Physician's Leisure Library.
Detroit, Mich.: Geo. S. Davis, 1887.

The ignorant physician, ignorant of the cunning art of the oculist, may search many primers and handbooks for advice on the topic discussed in this book. He will generally be disgusted, and conclude that if the specialist has any really valuable hints to give him, the fear of trusting him too much, and of lifting the veil of the oculistic Isis too high, has deterred him from revealing them. There is only one way that will occur to him, —*i.e.*, to study the specialty himself, and "become as gods," knowing all about it, as well as his teachers. Dr. Roosa, however, has something to tell, that he tells without fear of rivalry, and has produced the most useful monograph which we have yet seen. By reading it carefully, and getting this simple and cheap apparatus that he recommends, one can without an excess of knowledge decide pretty readily as to any necessity for sending his patient to the higher powers. He also has the good old-fashioned way of talking plain English, and when he uses technical terms he explains them, so that the explanation explains, and is not, as so often, worse than the problem. We think the trifling cost of this book will be money well expended by any one in the profession and in Cimmerian darkness on the subject, that so many are in, who will buy it and read it until its contents are familiar. E. W. W.

CYCLOPÆDIA OF OBSTETRICS AND GYNÆCOLOGY. Vol. VI. and Vol. VII. A Handbook of General and Operative Gynæcology. By Dr. A. Hegar and Dr. R. Kaltenbach. In two volumes, Vol. I. and Vol. II. Edited by Egbert H. Grandin, M.D., etc.
New York: Wm. Wood & Co., 1887.

The value of the Cyclopædia becomes more evident with the issue of each succeeding volume. Of the two before us, Vol. VI. of the series contains sections on gynæcological examinations, minor therapeutic manipulations and elementary operations, and operations on the ovaries. The discussion of anæsthesia as used for examinations is interesting. The author prefers ether. The directions given for the various procedures are simple and intelligible. Everything necessary is well illustrated by good wood-cuts. As regards dilatation of the urethra to admit the finger, we find the author expressing the idea that patients, after this method of exploration has been employed, "are not secure against permanent incontinence." In regard to specula and the methods of using them, we find little or nothing novel or original. Cervical dilatation the author produces by "solid, bougie-like instruments of unchanging size." The author's are of hard rubber, cylindrical, not conical like those of Tait, but with conical tips. The diameters increase

from two millimetres by degrees of one millimetre. Eversion of the rectum is recommended for inspecting the lower part of the anterior rectal wall; for the rest specula are needed.

Accidents following the use of vaginal injections are attributed by the author to all forms of instruments, but less to the irrigation than to the rubber compression syringes. Many accidents are not easily explained. The uterine syringe, if used with care, is not entirely abandoned. The canal should always be somewhat dilated previous to their use. Irrigation of the uterine cavity is considered a valuable therapeutic agent.

Pessaries are considered as a necessary evil. Everything possible to benefit the existing condition should be done before their introduction. Abdominal belts are recommended for a certain class of cases. Studley's double ring pessary is described, along with many other new and rare instruments. Tampons, local abstraction of blood, and artificial impregnation are discussed. Of the latter procedure he says very truly that so many causes not requiring it may be found as the real factors in the causation of sterility that but little remains for artificial impregnation to do; it may be employed in stenoses, especially flexion stenoses in the upper part of the cervical canal. "Every physician," he says, "will probably experience a feeling of disgust at being concerned in such procedures;" "but there are motives" which may overcome such feelings. A more important matter than mere squeamishness is the extreme doubtfulness of a successful result. The spermatozoa are so fragile that their mere transfer to a syringe may result in their heads becoming separated from their tails. In order to win in this game both heads and tails are required, it seems. Massage in gynæcology is discussed pretty exhaustively, and the author concludes that its results are by no means very valuable. General and special operative procedures occupies the remainder of Volume VI. There is an excellent section on the prevention of surgical infection, and the subject of ovariotomy finishes the volume.

The second volume contains operations on the tubes, broad ligaments, and vagina; operations in urinary fistulæ, prolapse operations, and operations on the vulva and perineum. The whole subject of the disease of the tubes, and operations for their relief and cure, is so new, and is exciting so much interest, that on that account, if no other, the present volume will be eagerly sought and studied. All that illustration can do will be found here, and the various operations and modifications of operations are minutely and clearly described. E. W. W.

A System of Gynæcology by American Authors. Edited by Matthew Mann, A.M., M.D., etc. Vol. I. Three colored plates and two hundred wood engravings.

Philadelphia: Lea Brothers & Co., 1887.

"Gynæcology," the editor tells us, "has now grown to an extent which requires for its thorough treatment the co-operation of representative men." Growth of Western towns and cities pales before the achievements of gynæcology,—twenty years ago nameless, to-day full-grown. In these few years we have witnessed the development of a science; is it possible, asks the observer, for another score of years to give us another equal increment? Will not research and daring exhaust the field? Will not subdivision and specialism reach ere long their ultimate atoms adamantine and indivisible? Has not the field been exhausted by the reaper, the gleaner, the very birds of the air, and have we not, in reaching the microscopic stage of investigation, neared the end?

Dr. Mann, in any case, has done us a service. If this be almost a completed science, then he has gathered it together in one perfected whole, and his work will be all the better appreciated.

The excellent historical sketch of gynæcology, by Edward W. Jenks, M.D., opens the volume. There is shown its progress from Hippocrates till to-day,—progress very slow and tortoise-like for centuries, then very rapid and electric for the past few years. As for its further progress, in reading the flood of literature it evokes one is struck with the universal sameness of the material, and the vast efforts made by the writers to strike out new paths, efforts by no means always successful.

"The Development of the Female Genitals," by Henry J. Garrigues, M.D., "The Anatomy of the Female Pelvic Organs" by Henry C. Coe, M.D., follow the opening chapter. Dr. Coe has given a very minute, elaborate, excellently-written and profusely-illustrated article. It is by no means dry and unsuggestive, but filled with practical remarks, like a running commentary. "Malformation of the Female Genital Organs" is another excellent article by Dr. Garrigues. "Gynæcological Diagnosis," by Egbert H. Grandin, M.D., marks the commencement of the truly practical part of the book. Here we are introduced to all the many instruments

and varieties of instruments which Smith has appropriated and Jones modified for diagnostic purposes. Good wood-cuts delineate them and careful description tells us how to use them. The author is far from condemning the uterine sound. Except in pregnancy and cellulitis it is incapable of doing harm if properly used. The routine rectal examination he thinks unnecessary, but urges it in virgins as a preliminary to vaginal examination, often obviating the necessity for the latter. "General Consideration of Gynæcological Surgery," by E. C. Dudley, A.B., M.D. In this article general antisepsis, the use of opium, quinine, and ice, are studied; the important question of "when to operate" is discussed, with "preparatory treatment;" in short, all the practical minutiæ of operative procedure are carefully enumerated. "General Therapeutics," by Alexander H. Skene, M.D., is another valuable contribution, which aims to give the reader "a rational system of therapeutics." The study of different remedies and their value in this chapter is excellent.

"Electricity in Gynæcology," by G. D. Rockwell, A.M., M.D., and "Menstruation and its Disorders," by W. Gill Wylie, M.D., form the next two chapters, followed by one on "Sterility" by A. Reeves Jackson, A.M., M.D. "Diseases of the Vulva," by Dr. Matthew D. Mann, treats of malformations, injuries and wounds, hernia, vulvitis, ulcerations, œdema, phlebectasia, and hæmatoma, of the skin-diseases affecting the vulva, of vaginismus and coccydinia, and contains, besides woodcut illustrations, one very fine colored plate of lupus hypertrophicus. Throughout the article the treatment of disease occupies a prominent place, and adds greatly to its value.

Dr. Chauncey D. Palmer contributes the article on "Inflammatory Affections of the Uterus;" also well illustrated, and containing two excellent colored plates exhibiting erosions of cervo-granular degeneration, elongation, catarrh, laceration, chonic hyperæmia, metritis, and endometritis.

"Sub-Involution of the Uterus and Vagina" is by Thaddeus A. Reamy, A.M., M.D., and "Peri-Uterine Inflammation" by Richard B. Maury, M.D. The latter is of especial interest at present, and gains added value from its discussion of the benefits of the antiseptic midwifery. The volume concludes with "Pelvic Hæmatocele and Hæmatoma," by Ely Van De Warker, M.D. These varied and valuable articles cover seven hundred and sixty-nine pages, and in almost, if not all, cases exhibit a thorough, systematic, and complete study of these various subjects in the light of the knowledge of to-day. We think this work as far as published bids fair to stand first in works of the kind, and contains all that is to be found in many books and scattered in many periodicals here brought together in one accessible and not too voluminous whole. E. W. W.

TRANSACTIONS OF THE MICHIGAN STATE MEDICAL SOCIETY. Vol. IX. 1887.
Detroit: D. O. Haynes & Co.

TRANSACTIONS OF THE MEDICAL ASSOCIATION OF THE STATE OF MISSOURI. Thirteenth Annual Session. 1887.
St. Louis: W. E. Correvas.

The Transactions of the Michigan Society present us with a number of papers of considerable interest. "How Typhoids are Generated in Germany" is an able article on sewage irrigation. "Some of the Cold-Weather Communicable Diseases" discusses the communicability of diphtheria, smallpox, scarlet fever. Evidently the society, in its discussion of the paper, felt no hesitation in struggling with the great bacteria problem. "The Nature and Treatment of Cholera Infantum" deals with the question of a special ptomaine as the active agent in the production of the symptoms of the disease. Chemically isolated by the writer, Dr. Victor C. Vaughan, he is prepared to prove that it exists in cheese, ice-cream, and milk under certain conditions, and "may be made artificially by the action of nitrous acid gas at a low temperature upon the nitrate-butyrate or other salt of anilin." It is "decomposed when heated with water to near the boiling-point, and is developed in milk by the growth of a germ which multiplies very rapidly when the conditions are favorable." The conditions—limited air and a warm temperature—are found when newly-drawn warm milk is placed in tightly-closed cans and then kept warm. This discovery of Dr. Vaughan has attracted much attention during the past year, and, while perhaps too much stress has been laid upon its importance, it is well to bear it perpetually in mind, though as yet none of the methods proposed for its utilization, none of the agents advanced as antidotes for tyrotoxicon, seem effectual remedies. Time alone will tell whether in this discovery we have the clue both to the causation of certain diarrhœas and at the same time to an accurate method of cure. The whole article, however, deserves a thorough study, not omitting from

attention Dr. Vaughan's method of preventing by proper care the formation in milk and milk-compounds of this obnoxious substance. Perhaps the most suggestive clinical observation made by the author is upon the recurrence of diarrhœa when even good milk is again reverted to as a food after milk containing tyrotoxicon has already set up its diarrhœa. This observation, many times repeated, seems to show that there is still left, after the violent vomiting and purging, something—organisms of the nature of bacteria or ferments—which finds in the pure milk, when given as food, a field for the development of more poison. This is analogous to what occurs after apparent recovery from Asiatic cholera, where a number of observers have attributed serious and even fatal relapses to a few teaspoonfuls of milk. The author of the paper promises to give to the world the results of his further experiments, undertaken "with the object of ascertaining the effects of certain germicides on the development of the poison."

The volume contains many papers of interest: a very good one on "Constipation;" one on "Bergeon's Method;" on "Imperative Impulses in Mental Disease;" on "The Analogy between Acute Idiopathic Pleuritis and Acute Articular Rheumatism," in which the writer endeavors to prove the essentially identical causation of both diseases; very good articles on "Pseudo-Membranous Sore Throat" and "A Few Thoughts on the Nature of Diphtheria."

In the department of "Surgery" we find "Antiseptic Surgery for the Country Physician," an article on "Intubation and Tracheotomy," on "Treatment of Hemorrhoids and Fissure of Anus by Gradual Dilatation," on "Nasal Obstructions." Under "Ovariotomy" articles on "Ophthalmia Neonatorum," "Vaginismus," "Is Gynæcology Fashionable?" "On the Radical Cure of Retrodisplacements of Uterus and Procidentia by Surgical Operation," a case of hysterectomy, and other papers. These are all good, live papers, and show a somewhat high average of excellence.

The Transactions of the State Society of Missouri are more brief, but have excellent articles on a variety of topics, among others, "On the Practical Applicability of the Theories of Bacteriology," "Proper Food for Infancy and Childhood, etc.," "Milk as a Source or Medium of Infection;" in fact, a very considerable amount of good, substantial medical work is shown in these papers, proving that the West is fully capable of doing its share in the march of progress. E. W. W.

ANATOMY, DESCRIPTIVE AND SURGICAL. By Henry Gray, F.R.S. Edited by T. Pickering Pick. A new American from the eleventh English edition. Thoroughly revised and re-edited, with additions, by William W. Keen, M.D. To which is added Landmarks, Medical and Surgical. By Luther Holden, F.R.C.S.

Philadelphia: H. C. Lea's Son & Co.

How many thousand copies of Gray's "Anatomy" have been sold to the rising generation of doctors in the United States during this last twenty years no one who has not access to the books of the Lea Brothers can well tell. But certainly this work has been a mine of wealth, which has been both carefully and successfully worked by the American publishers. It would be very interesting to know how much of the stream of gold has dribbled into the pockets of the authors and editors of the book. The present volume maintains all the features which have given so great popularity to the work of Dr. Gray. It has been brought up well abreast to the times by the English editor, and has added to it very much of interest during its passage through the Philadelphia press. In most of the figures the arteries are colored red, the veins blue, and the nerves yellow; also in the figures of the bones attachments of the various muscles are outlined red. This certainly gives not only greater picturesqueness but greater distinctness to the drawings, and adds very much to the ease with which they are rapidly comprehended on inspection. Altogether the book, as it now stands, is probably the most useful for immediate hurried reference, as well as for the purposes of the student, that there is in the language. Of course it lacks the completeness and minuteness of such a great work as Allen's "Anatomy," or even the two-volume book of Sharpey and Quain.

INSANITY: ITS CLASSIFICATION, DIAGNOSIS, AND TREATMENT. A MANUAL FOR STUDENTS AND PRACTITIONERS OF MEDICINE. By E. C. Spitzka, M.D.

New York: E. B. Treat, 1887.

We confess to a feeling of disappointment when we found that this work of Dr. Spitzka, of whose approach to our editorial table we had previously heard, was nothing but the second edition of his well known manual, and not the larger treatise which the preface of the first edition made us hope soon to see. It is hardly necessary to notice in detail the second edition of a book which follows so soon upon the first. It is sufficient to reiterate the opinion, that we affirmed after

careful reading of the first edition,—namely, that the work is, upon the whole, the most satisfactory study of insanity that we know of in the language. It is a great pity that Dr. Spitzka could not find a publisher who would make his volume more attractive in the matter of type and paper. Possibly fifteen cents a volume are saved in the cost of publishing the book, but we opine most readers would sooner give three dollars for a handsome book than two dollars and seventy-five cents for the one that is before us.

Correspondence.

LONDON.

(From our Special Correspondent.)

I am writing to you in the beginning of November, but the shades of the waning year are already falling upon us. We have passed through the first outburst of acute catarrhs and congestions begotten by cold and damp, or by the organisms, as some of our friends would say, which arise and flourish in the inclement and unpropitious meteorological conditions that characterize the opening of an English winter. Christmas will presently be here, with the pleasant respite from labor, and the few days of air and sunshine with our friends in the country, which, it is to be hoped, some of us may manage to secure. Meanwhile, we are hard at work. The winter session at the medical schools is in full swing. The societies leave us hardly one quiet evening at home out of the six. The journals are supposed to be publishing more attractive and useful communications than those which satisfied the editorial conscience and their limited circle of readers in the silly season. With all this the question rises in the thoughtful mind, What progress can be claimed during the year that is dying? As one grows older and more gray one comes to be more accustomed to slowness in real advance, to be satisfied rather with steady, even if it be but small, improvement, than to be prospecting and retrospecting for startling epoch-making discoveries.

Therefore it is that I am not dissatisfied with our record for the passing year. From my present stand-point I can see that we are nearer the truth in certain great questions pathological, and have attained to greater success in certain great matters therapeutical, than was our position in November, 1886.

Beyond all question the greatest development in treatment with us during the year is to be found in *surgery*. I do not mean by this to directly insist upon the successes achieved by English surgeons in their formidable undertakings on the brain and abdominal cavity, brilliant though these undertakings are. I do not refer to operations, but to *operating*. There is something about the whole proceeding in the excision of a breast or the removal of a kidney nowadays that strikes us as perfectly unlike the method of operating a few years ago. At the bottom of this change for the better lies one great principle,—cleanliness. Whether we choose to regard this as a pathological or as a therapeutical advance matters nothing: when the science of medicine is perfect, pathology and treatment will stand side by side in their mutual interdependence. Perchloride of mercury has undoubtedly attained a high position as a disinfectant and antiseptic during the past twelve months, while iodoform holds its own in its proper sphere of application. With these and other antiseptics, and with the clear appreciation of the principles on which they act, the surgeon now finds the field of his operations increased to an almost unlimited extent.

A continued effort has been made in England, during the year, as well as on the Continent and with yourselves, to *press* into the service of the physician those disinfectant measures which have gained so much credit for the surgeon. But, unless where the knife can reach, I fear but little real improvement has been effected in this way. We can now treat empyema with something approaching satisfaction, but phthisis remains an *opprobrium rædendi*. Intrapulmonary injections have been tried without success,—to put the result as favorably as possible. Inhalations continue to hold a place in the practice of many, but are as consistently deprecated by authorities of equal eminence. The year has practically seen the birth and the death of the Bergeon treatment in this country. I have failed to find a single word spoken in favor of intrarectal injections in England, always excepting the occasional record of a successful case, valueless, of course, from a scientific point of view. Not that the method has been condemned untried. Although we have not arrived at the pitch of enthusiasm on this subject which you appear to have reached in the States,—to judge by the number of advertisements of apparatus in the sheets of your medical journals,—still, I am assured that the gaseous enemata have been

fairly tested. With this experience fresh in our minds, let us be more cautious and critical in the future.

When we turn to the department of diseases of the *heart*, we are tempted to point at once with a sense of satisfaction and insular pride to the secure position which strophanthus continues to hold among the cardiac tonics. Of the value of this drug there can be no doubt. Much has been written, in a loose and casual way, about the use of strophanthus in dropsy; and many comparisons, for and against it, have been drawn with digitalis. All this is little to the point; but the fact remains clear and unquestionable that Professor Fraser, of Edinburgh, has introduced to us a cardio-vascular agent of the first rank, which rapidly increases the cardiac force and raises the arterial pressure in cases of dilatation of the heart, and which evidences its power for good both by free diuresis and by speedy amelioration of subjective distress. With the advance of strophanthus in estimation may be said to have occurred the comparative decline of convallaria and caffeine, about which we heard so much a few years ago. Neither of these drugs appears to possess the reliability of digitalis and strophanthus. It is only our leading authorities that seriously attempt to discriminate the cases of heart-disease suitable for each of these drugs respectively, or for combinations of any two of them. I gather that in England there is a pretty general agreement with the view that has been lately arrived at on the Continent from experimental evidence, that caffeine is strictly a direct renal stimulant, not a cardiac tonic; and that to secure its full action in dropsy we ought to combine it with digitalis, convallaria, or strophanthus.

Our specialists in diseases of the *nervous* system are not as a body known for their confidence in therapeutics: their attention is so fully occupied with the investigation of the pathological and regional diagnosis of cerebral and spinal disease that they have but little time or enthusiasm left for other than routine treatment. Yet the soundness of the method that they pursue—the thorough investigation of the nature of disease as the first step—has lately been proved by brilliant therapeutic results. Foremost in this connection comes, of course, the surgical treatment of tumors of the brain and cord, some instances of which I have had occasion to mention in my recent letters to you. Next in importance to these results must be regarded, in my opinion, the discovery and treatment of peripheral paralysis, especially alcoholic paralysis. This disease proves to be far more common in England than we had any idea of; and it is not easy to exaggerate the amount of benefit that has been accomplished for patients since it came to be generally recognized and properly treated. No clearer illustration than alcoholic paralysis could be adduced at this moment of the soundness of the view expressed in an early part of this letter, that the best kind of progress in medicine is that which is slow, steady, and unphenomenal.

We have heard very little, so far, in England of the application of the newer methods of investigating and treating diseases of *digestion*. You know what I refer to,—the method of systematically emptying the stomach by various means, whether after a test-meal or not, and whether for the purpose of diagnosis or of treatment. Abundant attention has lately been drawn to the use of the stomach-tube in articles in our journals bearing on the observations of German and Russian physicians, and only a couple of weeks ago Dr. Clifford Allbutt brought the subject forcibly before the Medical Society of London. I fear our patients have too much of a dislike—not to say horror—of forcible evacuation of the stomach for this method ever to be much practised here, unless in urgent cases of dilatation, when relief by siphoning is eagerly practised by the sufferers themselves after a little education. We must be content to accept the conclusions arrived at by our continental *confrères* when they are a little more settled than is the case at present, and then, I trust, we shall be able to make a considerable advance on the present system of treating indigestion.

In the department of diseases of the *skin* we have again to acknowledge that we are content to adopt improvements that have recently been introduced to our notice from Germany. The paper which Dr. Unna, of Hamburg, read in Dublin, in August, on the treatment of cutaneous affections by glycerin, gelatins, salve-mulls, and plaster-mulls, appears to me not only to be a contribution of the greatest practical value, but to deal with the therapeutics of diseases of the skin in a far more scientific fashion than had ever previously been attempted.

Among the *newer drugs* that we are now using are jumbul-seeds and saccharin. Both of these may be of use in some cases of diabetes to make life more tolerable, if not to cure the disease. Saccharin is already being extensively employed both by the profession

and by the laity, and will, let us hope, diminish the amount of "liver" in this country. So far I have heard nothing in England of your wonderful new remedy stenocarpine, or gleditschine, or whatever it is to be called, but it is certain to be tested at the earliest opportunity by some of our very active ophthalmologists.

I feel that I cannot fittingly conclude this brief and imperfect summary of the principal advances of therapeutical science in England during 1887 without recording an attempt that is now being made to organize our work in this subject. I refer to the establishment of a therapeutical society in London. I cannot tell you much that is definite about this proposal; but it is at least encouraging to know that thought is being stirred among us in the interest of scientific treatment. So far, I believe, the organization is mainly or entirely on paper; but if it be the case that Professor Ringer has accepted the presidency of the society, and as the movement appears to be in the hands of a very active council, a good beginning ought to be secured for it. No doubt there will be plenty of advice forthcoming as to the ends and methods of a learned body of this kind. Possibly it may follow the lines of the better part of Dr. Whitla's Dublin scheme, which I criticised freely in my last letter to you. The field lies open to our hospital physicians; the material is practically unlimited; the results are highly promising. Let us hope that by this time next year it may be in the power of your London correspondent to render you a better account of service done in that department of our profession which the GAZETTE so worthily represents, and the promotion of which ought to be and ever must be the chief end and glory of scientific medicine.

PARIS.

(From our Special Correspondent.)

When Dr. Luys read before the Academy of Medicine his extraordinary memoir on "Therapeutics from a Distance" ("Thérapeutique à Distance"), it will probably be remembered that a committee was appointed to examine the facts critically. But academical committees are proverbially slow, and medical societies have begun inquiries of their own, without waiting for the decision of the old lady in the Rue des Saints-Pères. At a meeting of the Therapeutical Society, Dr. Constantin Paul related the following experience. He supplied Dr. Bourru, of Rochefort, with a very sensitive subject, and requested him to repeat the experiments in question. The conditions were the best possible; but few persons were present, and full latitude was left to the performer. If Dr. Bourru was unsuccessful, he must blame no one but himself. The first experiment was with a vial of alcohol; but, as the container was, contrary to all rules, left uncorked, and the sense of smell is very acute in hypnotized subjects, the whole trial is questionable. Dr. Bourru pointed out the titubating gait of the patient when just awakened; but the same symptoms being observed when subjects recover from the hypnotic state, the experiment remains doubtful. In the next trial, the vial was applied to the right side of the occiput. The patient manifested a feeling of comfort and satisfaction that should have been caused by the cherry-laurel water supposed to be in the vial. Unfortunately, owing to some misunderstanding, the pharmacist had filled the bottle with plain water! Five or six other experiments were quite as doubtful, and prove absolutely nothing. No reason exists, therefore,—and it should be widely made known,—for the public excitement consequent upon Dr. Luys's communication. Dr. Voisin, having, on his side, instituted another series of experiments with different subjects, reached the same conclusion,—namely, that Drs. Luys, Bourru, and Burot are mistaken. Before the Medico-Psychologic Society he declared it his opinion that the phenomena attributed to the so-called "therapeutics from a distance" are the outcome of suggestion and the retentive memory of hypnotized subjects. The facts related were as follows: The patient, a female, having been brought into hypnotic sleep, and perfect silence being observed by the bystanders, a number of sealed vials were placed in contact with the subject, who had been left in ignorance of the intended experiments. No change of any sort was observed. Then Dr. Voisin, holding an empty vial, drew near her, saying he was going to try on the patient the effects of medicaments from a distance, and would successively bring by her several medicines, which would diversely affect her, according to their nature. "Here is alcohol," he said, "which will rapidly cause inebriety, the effect disappearing as the vial is removed." Having brought the empty vial close to the patient, symptoms of inebriety were manifested, which disappeared when the bottle was removed. Next, simulating the motion of

taking other vials, but always bringing the same empty bottle close to the subject, he announced the different effects to be expected from strychnine, cherry-laurel water, valerian, pilocarpine, etc. The phenomena predicted never failed to appear. Two months later Dr. Voisin put the same subject again into the hypnotic state, and made, as before, the announcement that the patient would be able to distinguish the medicaments by the symptoms she would exhibit. Then, repeating the same performance as before, but not naming the supposed medicine, he brought the empty bottle close to the patient. Strange to say, with every pretended change of vial the subject manifested the same symptoms as in the previous experiment, and precisely in the same order, without a single mistake, thus illustrating the extraordinary memory of hypnotized patients. The only conclusion to be drawn from the foregoing is that *thérapeutique à distance* is a delusion, and that the phenomena observed belong to the domain of psychology, not therapeutics.

Such is not the case, however, with *complaints against antipyrin*,—a topic decidedly therapeutical. Poor antipyrin! evil days seem to have fallen upon it. Barely six months ago praises only could be heard from all sides, and now complaints and condemnation come pouring in from all quarters. The pharmacists were the first to find fault, and with good reason. The article supplied for some time past by the German patentees has been most impure and unfit to use medicinally, owing to its offensive smell of benzole. As an excuse, the manufacturers claimed it was necessary to crystallize antipyrin from a benzole solution, and that the demand has been so large and unexpected that it had not been possible to sufficiently free the crystals from the solvent. The Paris Pharmaceutical Society made short work of such pretexts by showing that antipyrin can very well be crystallized from ether, or even distilled water, and that pharmacists had been obliged to thus purify themselves the bad chemical supplied by the monopolists; so that there was no excuse, if there ever be, for issuing an impure, foul-smelling medicine. It is even said legal steps are to be taken to set aside the French patent as null and void. With this side of the question we have nothing to do; but what is of more concern—even than defective fabrication, probably temporary—is the number of complaints made by physicians against the effects of antipyrin. Dr. Finot, of the Medico-Practical Society, was the other day relating how a patient, treated last October with two hypodermic injections of antipyrin, suffered two days later from cellular induration and erysipelas to such an extent as to be obliged to keep stooping forward from pain and inflammation. Proper antiphlogistic treatment, during ten or twelve days, avoided the formation of the threatened phlegmons, but two painful indurated centres are still existing, while their resolution remains yet doubtful. Dr. F. Roux made a report equally unfavorable. "I gave antipyrin," he said, "in the doses recommended to three patients suffering from migraine. One experienced profuse perspiration, nausea, and vomitings. The pain was in no way relieved, and, when the fit had run its natural course, the patient felt weaker than ever before. The second was not hurt by antipyrin, but neither was he relieved in the least. And, finally, the third patient experienced some marked relief, but not the instant cure spoken of by Dr. Germain Sée. In a patient suffering from rebellious sciatica antipyrin exhibited both through the stomach and hypodermically produced no result. The injections were very painful, but the aching remained. And, lastly, a hysterical patient, affected with abdominal neuralgia, took antipyrin without the slightest benefit. I should like to know whether my brother physicians have observed similar results."

The therapeutic action of *bismuth salicylate* offers some peculiarities that it may be well to bear in mind. Dr. Legendre, the other day, was relating before a medical society some facts which had somewhat puzzled him. In Dr. Grancher's service it seems salicylate of bismuth is frequently employed in gastro-intestinal affections and typhoid fever. For some time past it has been noticed that children subjected to this treatment often passed salicylic acid in their urines, and occasionally experienced the well-known cerebral disturbances characteristic of salicylic acid. Having inquired of the hospital pharmacist, he was only informed that the salt of the market is apt to be, at times, a mere mixture of salicylic acid and subnitrate of bismuth. Dr. Legendre thought the statement might be true, yet the explanation hardly satisfied him, and he called upon some of the members present for some better solution, when Dr. Bouchard remarked that there are two compounds of bismuth and salicylic acid, one basic and the other acid, and both easily give up their acid, especially the non-basic salt. Salicylate of bismuth, as such, is not an anti-

septic, but becomes one whenever fermentations take place, which set the acid free. When salicylate of bismuth is administered alone, as various fermentations and putrefactions occur in the intestines at the time it reaches there, acids are generated,—the hydrosulphuric among them,—which displace the salicylic acid from its combination. The latter will now appear in the urine, while the fæcal matters will be colored black by sulphide of bismuth. But if salicylate of bismuth be associated with other antiseptic substances, most likely such black coloration will not be observed, and no salicylic acid will appear in the urine. Whenever such symptoms are noticed, they can be made to disappear through the administration of antiseptics, because on effecting intestinal antisepsis the decomposition no longer takes place.

Melinite, as an explosive, is, of course, chiefly of concern to surgeons, but as a poisonous compound it belongs to therapeutics, while its novelty provokes the curiosity of all. Dr. Tachard, an army surgeon-major of the first class, has given an instructive account of the effects of the new French explosive. An accident occurred, not long since, in a fortress while men were preparing melinite bomb-shells. Out of the seventeen soldiers within range eleven were killed on the spot, or died shortly afterwards. The survivors' wounds deserve the following remarks: To begin with, no burns could be noticed, and no accidents that could be attributed to the inhaling of poisonous fumes. Hence melinite acts only mechanically. From a surgical point of view, a fact deserving notice is the great number, depth, and small size of the wounds, dangerous in character, caused by very minute fragments of cast iron, barely larger than a grain of sand. The particles extracted were of irregular shape, with sharp edges, but free from smell or foreign chemical compounds. A remarkable fact is that the effects on the bones were strictly local, and no fissures or slits could be observed, such as are seen with ordinary bullet wounds. The extreme violence of the impact suffices to break the bone at the first point of contact, and it is only further on that the parts become broken, as the cast iron penetrates into the bony structure. The general aspect of the wounded is characteristic. The uncovered parts have an intense light-yellow color, rapidly spreading, so as to stain the linen. Deathly pallor overspreads the face. Some patients are almost prostrated; others, on the contrary, are excited, and groan restlessly. The small wounds riddling the body, and closed with a clot of blood, were about two millimetres (one-twelfth of an inch) in diameter, ten or fifteen centimetres (four to six inches) deep, and contained a parcel of cast iron the size of a grain of sand. The treatment followed was the usual one indicated from the nature of the wounds, and was reasonably successful. But an idea that suggests itself is to use powerful electro-magnets for the purpose of helping the removal of the foreign metallic particles.

An improved formula for *artificial serum* may prove useful to blood specialists. Dr. Mayet, of Lyons, has recommended the following: Distilled water, 100 grammes; anhydrous phosphate of sodium, 2 grammes; sugar, enough to bring the solution to sp. gr. 1.085. As most microscopists are conversant with the metrical system, it is probably unnecessary to translate the foregoing into Troy weights. Dr. Mayet finds the liquid an excellent medium for preserving blood-corpuscles and globular elements without alteration, so that they may easily be counted and examined in cases of anæmia, leucocythæmia, etc. Owing to the density and slight viscosity due to the sugar, and the preserving action of the alkaline salt, the different elements are prevented from adhering together, and equally distributed in the fluid. Only, the liquid layer between the plates being thicker than with other media, the focus must be adjusted so as to distinguish separately the various elements of different densities floating in the artificial serum.

PARIS, November 18, 1887.

OIL OF SASSAFRAS TO DISGUISE THE ODOR OF IODOFORM.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In your October number I see that "C. E. Dodsley affirms that the addition of four drops of the oil of sassafras to the ounce of iodoform completely does away with the disagreeable odor." You well added, "This is certainly important, if true."

Having had occasion to use a great deal of it in the past few weeks, I tried his suggestion, and find that in the bulk form the oil does disguise the disagreeable odor; but as soon as the iodoform comes in contact with the skin, or with a sore, the oil seems to evaporate, and leaves the odor as pungent as ever. I have given it a thorough trial, and I am sorry to find that the oil does not prevent the

disagreeableness of its application (the smell). I have left the bulk in contact with the open air, and the oil does not evaporate, but, strange to say, it only requires contact with the skin to bring out the full odor. I hope some one else will favor us with his experiments in this line, as I stand open to corrections, and hope it may be proven that I have been mistaken.

Very respectfully,

JOHN H. HARDEN, M.D.

CHERAW, S. C., November 19, 1887.

Notes and Queries.

PEMPHIGUS, ARSENICAL PIGMENTATION, UNUSUAL AFFECTION OF CICATRIX.

At a recent meeting of the Clinical Society of London, DR. HANDFORD (*Brit. Med. Journ.*, October 22, 1887) reported a case of pemphigus occurring in a child aged 13, and terminating in incomplete recovery after nearly a year. The limbs, trunk (except parts of the chest and abdomen), face, tongue, mouth, pharynx, mucous membrane of the nose, conjunctivæ, and orifice of the vagina were all affected. The eruption came out in crops, and was accompanied by rise of temperature. Micro-organisms were found in the bullæ which contained pus, but not in those which contained serum. Quinine in large doses was given with benefit, and arsenic. Of the latter, 15-minim doses of Fowler's solution were given thrice daily, and continued for ten weeks. After this the skin of the whole body was noticed to be dry, brawny, and darkened in color. The axillæ, groins, and abdomen were almost as dark as in Addison's disease. The skin looked dirty, but the color was proved to be due to pigment, deposited chiefly in the rete, but partly in the more superficial epithelium. The arsenic was stopped, and the patient treated by wet-packing, and in a month the skin had resumed its normal, smooth, moist appearance, and much of the pigmentation had disappeared. Also on the hands and feet there were many elongated patches of cicatricial-looking skin, thickened and elevated. These patches were covered with white points, like millet-seeds, just beneath the epithelium, and resembling, to the naked eye, miliary tubercles. They were not tubercular, but consisted of accumulations of degenerating epithelial cells in the deeper part of the epidermis. They disappeared in four or five months. It was possible that this condition also was due to the arsenic. Several colored drawings and photographs illustrating these conditions were exhibited. A third case of pemphigus was described, in which there was some ground for suspecting implication of the mucous membrane of the intestinal canal. It presented also the atrophied glossy condition of the skin of the hands mentioned in the first case, and which was suggestive of an implication of the peripheral nerves. No definite affection of sensation or of the reflexes, however, could be discovered, though reference was made to the statement of Dr. Pasquale Ferraro, that he had found advanced changes of an atrophic degenerative nature in the posterior horns of the dorsal spinal cord, and also in the peripheral nerves, the ganglia on the posterior nerve-roots, and in the sympathetic ganglia. Two further instances of arsenical pigmentation were narrated, and the opinion was expressed that small doses of arsenic (℥ v to ℥ x) of the liq. arsenicalis repeated thrice daily for about two months were capable of producing a pigmentation of the skin, chiefly of the abdomen, lower part of the chest, lumbar region of the back, axillæ, groins, and inner parts of the thighs. This condition was not necessarily accompanied by roughness and dryness of the skin, and disappeared slowly in from one to four months, or rather longer.

DR. CROCKER, referring to the pigmentation of the skin, said that this was fairly common on the site of eruption, as a result of the treatment of psoriasis by arsenic. General pigmentation, however, was less common, but did, nevertheless, occur from time to time. He had then under his care a boy with a bullous erythema, which he was treating by arsenic. Latterly the boy's skin had become pigmented. He thought it should be generally known that pigmentation was likely to follow prolonged treatment with arsenic, quite independently of the eruption. It was probably due to a deposit of the metal itself in the skin. The pigmentation lasted a very considerable time, much longer than four months, as mentioned by the reader of the paper.

DR. GOODHART took up the question of fever mentioned by the reader of the paper, he having a case now under his notice, in a little girl, in which high fever occasionally occurred. He said that this case showed very plainly the peculiar property of arsenic to control the disease, though not to cure it. In this case the dose of arsenic required to subdue the eruption was so high that it could

not be continued, and then the eruption recurred.

Sir Dyce Duckworth wished to add his testimony as to the value of arsenic in the treatment of pemphigus. He had formerly been sceptical as to the benefits claimed for its use, but had more recently had ample proof of its efficacy, several cases having been apparently quite cured thereby. In one of these cases marked pigmentation had followed the use of 12 minims of arsenical solution three times a day.

FLUID EXTRACT OF PICHI IN VESICAL CATARRH.

Dr. H. S. Delamere, of Lubec, Me., referring to the use of pichi in the treatment of catarrh of the bladder, as reported by Dr. G. T. Comstock, relates the following case in the *Medical Record* for November 12, 1887:

"A. B., aged 28, had been suffering for two years from vesical catarrh. He had had gonorrhœa, but a No. 21 (French) bougie passed without difficulty, causing, however, considerable vesical tenesmus. When I was called to see him he was passing urine every hour during the day and four or five times during the night. The urine was alkaline, ropy, ammoniacal, and the microscope revealed pus. I gave the usual remedies prescribed in country practice, such as buchu, uva ursi, etc., but without benefit. I then resorted to washing out the bladder by means of the double-channel catheter, with the effect of relieving my patient slightly. The least exposure, however, aggravated all the symptoms and caused as much suffering as ever. After about a year and a half of constant treatment, with no other result than to keep the disease at bay, I received a sample bottle of fluid extract of pichi, which I tried. After the patient had taken it a few days he expressed himself as feeling better. He was now getting up twice during the night. But the sample was gone, and I was obliged to wait until I could get a fresh supply. In the mean time the patient grew worse; had to get up three or four times during the night. As soon as the drug arrived I commenced giving him 20 drops four times a day, which dose I increased to 30 drops. In a few weeks my patient was so much better that I abandoned washing out the bladder, and to-day he is at work. The urine is clear, free from mucus and pus, and has no ammoniacal odor. He sleeps well, and does not have to get up more than once during the night. Notwithstanding he has suffered recently from a severe cold, the bladder-trouble has not returned. The man's general appearance is healthy, appetite good, and he seems well."

THE ACIDS OF THE STOMACH IN HEALTH AND DISEASE.

The following are the results of a series of researches made by Drs. Cahn and Von Mering concerning the acids of the stomach in health and in disease (*London Med. Record*, October 15, 1887): 1. The quantity of lactic and hydrochloric acids in the stomach can be determined. 2. In the healthy subject hydrochloric acid is found in the stomach half an hour after eating. 3. Under an exclusive meat diet hydrochloric acid alone is found. 4. In a mixed diet the stomach contains, both in a healthy and diseased state, hydrochloric, lactic, and volatile acids, the quantities varying according to the length of time the food remains in the stomach. 5. In fever and anæmia hydrochloric acid may be wanting, but it is always present in amyloid cachexia, and it is only exceptionally absent in carcinoma of the pylorus. Violet of methylaniline does not form a reliable test for the presence or absence of hydrochloric acid in the stomach.

THE VALUE OF THE FLUID EXTRACT OF QUEBRACHO.

According to the experiments of Dr. M. Bourdeaux (*Archives Médicales Belges*, April, 1887) the fluid extract of quebracho is a most energetic promoter of healing.

If painted or applied to wounds with a smooth surface it causes at first a slight passing sensation of pain (similar to that caused by an application of collodium), and promotes healing by first intention. It may be also used in burns and wounds caused by freezing, if the ulcerated spot has a healthy, rosy appearance. The extract, when painted on the wound, hardens in the course of an hour, and forms a hard brown crust, which clings firmly to the tissues, and can only be removed with warm water. The secretions of the wound dry up, and healing rapidly takes place, after which the brown crust will fall off.

The great advantage of this treatment is that it does away with all bandaging.—*Le Progrès Méd*, October 5, 1887.

THE TREATMENT OF CHOREA AND OTHER HYPERKINETIC DISEASES WITH PHYSOSTIGMINE.

Dr. L. Riess treated forty cases of chorea with physostigmine in subcutaneous injections of .001 ($\frac{1}{64}$ grain) once or twice a day, and found that its use resulted in materially shortening the length of the disease. He also observed a beneficial action of the drug in twelve cases of tremor (senile, alcoholic, and hysteric, etc.), and in four cases of paralysis agitans, in two cases of multiple sclerosis, and in three cases of Charcot's post-hemiplegic chorea. It was tried in five cases of tetanus, but the drug did not have as good an effect as might have been looked for, as it did not lessen the irritability of the central nervous system to any great extent.—*Zeitschrift für Therapie*, October 1, 1887.

BROM-ETHYL AND ITS VALUE IN DENTAL OPERATIONS.

After a dissertation on the different anæsthetics used in surgery, both dental and general, such as ether, chloroform, laughing-gas, etc., Dr. Julian Scheps, of Breslau, launches into an elaborate account of brom-ethyl, and of its great usefulness as a narcotic in dental surgery. He contends that it in a measure combines the valuable properties of both chloroform and laughing-gas. It resembles the former in its easy and simple method of administration, and the latter in the shortness of the effects and the rapid recovery from them. It is, however, neither accompanied by the danger of the first, nor does it necessitate the bulky and complicated method of administration of the second.

Brom-ethyl, ethylum bromatum, or ether bromatus (C_2H_5Br), is a colorless fluid, smelling like ether, of neutral reaction, neither inflammable nor explosive, and evaporating with great rapidity when exposed to the air.

In the year 1849 it was recommended by Nunnely as a general anæsthetic, but was not thoroughly investigated or studied until the years 1876 and 1877, by Rabuteau, who found, when experimenting with the drug on animals, that it was a quicker anæsthetic than chloroform; it had not, however, the irritating properties of chloroform. Brom-ethyl is entirely eliminated by the lungs; no trace of the drug was found in the urine. If the drug is inhaled for more than a half-hour, the animal will gradually die, the death being caused by gradual cessation of circulation and stoppage of the heart's action. Rabuteau's personal experiences with the drug were as follows: At first he experienced a slight ringing sensation in the ears, and after two minutes of deep breathing there was a lessening of the pulse-frequency and a wonderful decrease of the amount of breath required.

Since 1877 brom-ethyl has been used with great success in operations of the eye and ear by Dr. Turnbull, of Philadelphia, and later Dr. Levis, of the same city, used it in larger operations.

Terillon considers it to be a good local anæsthetic; he used it in spray form, and considered it much better than ether.

Dr. Levis lays particular weight on the remarkable rapidity with which it causes anæsthesia, as it acts in one-third the time that chloroform does, and also calls attention to the quick recovery from its effects and the almost entire absence of nausea and vomiting, and further states that its influence on the circulatory system is but slight.

All practitioners do not, however, by any means agree with Dr. Levis, or join him in praising the drug, as here and there serious results have followed its use. Two cases of death were reported by Dr. Roberts and Dr. Marion Sims as having resulted from its use.

Dr. H. C. Wood says that brom-ethyl has a directly paralyzing effect on the muscles of the heart, and thereby causes a marked decrease of the pressure of blood, and therefore is equally as dangerous as chloroform. Dr. Scheps states, however, that the dangerous symptoms only occur after long-continued inhalation, and he holds that the drug is perfectly safe in short operations.

The drug, says the author, should be administered in the same manner as chloroform, on an Esmarch's mask.

Terillon advises its being poured on a compress which covers the face, but Dr. Scheps says the mask only should be used under all circumstances.

The patient should be placed as horizontally as possible.

The author then gives a minute description of several remarkable cases, and gives a large number of other cases in tabular form.

All the cases relate to the extraction of diseased teeth.

The average dose of brom-ethyl required to produce anæsthesia was 15 grammes (4 drachms).

In most cases the patient was conscious of the extraction, but experienced no pain whatever. The author is of the opinion that in

introducing brom-ethyl into dental surgery he has brought forward an anæsthetic which can be rivalled by none.

Whether this is the case or not is very doubtful, and cannot yet be fully determined, as the drug has been but slightly tested and has but a limited use. It will be difficult, however, to find an anæsthetic which will take the place of laughing-gas.—*Centralblatt für Chirurgie*, September 24, 1887.

ANTIPYRIN INJECTIONS.

In order to avoid the pain consequent sometimes upon the subcutaneous injection of antipyrin, a comparatively dilute solution is used when possible. But in cases where in order to give immediate relief it becomes necessary to inject a large dose, such as a gramme of antipyrin dissolved in a gramme of water, PROFESSOR SÉE adds 15 to 20 milligrammes of cocaine hydrochlorate to each injection.—*Pharmaceutical Journal and Transactions*, October 29, 1887.

COCAINE CHLOROMERCURATE.

The addition of mercuric chloride to solutions of cocaine hydrochlorate intended for ophthalmic practice has been recommended, and a preparation used on the Continent under the name of "Sattler's solution," containing five grammes of cocaine hydrochlorate and two centigrammes of mercuric chloride to one hundred grammes of water, is generally esteemed to have antiseptic as well as anæsthetic properties. In experimenting as to the correctness of this assumption, MESSRS. BALBIANO and TARTUFERI found that when mercuric chloride is added to a solution of cocaine hydrochlorate a double salt is formed, having the composition represented by the formula $C_{17}H_{22}NO_4Cl.HgCl_2$ (*Ann. Chimica e di Farm.*, September, 1887, p. 157). The presence of this compound can be demonstrated by the formation of a white precipitate when the solution is moderately concentrated. The double salt was prepared separately, and was obtained as a white crystalline powder, melting at 122.5° to 123° C., and forming, upon cooling, a hard vitreous mass. It is only slightly soluble in cold water, one hundred cubic centimetres at 21° C. only taking up 0.536 gramme, but it is still less soluble in five per cent. solution of cocaine hydrochlorate, one hundred cubic centimetres at 24° C. only dissolving 0.135 gramme of the chloromercurate. Experiments were then made to test whether this compound confers any antiseptic properties upon solutions of cocaine hydrochlorate in which it occurs, the conclusion drawn being that in the proportion chloromercurate of cocaine is present in Sattler's solution (0.0425 per cent.) its influence as an antiseptic is negative.—*Pharmaceutical Journal and Transactions*, October 29, 1887.

LAMINUM ALBUM.

Laminum album is a labiate indigenous to Central Europe.

The blossoms appear in commerce under the name of *Flores lamii albæ seu urticæ mortue* (the German *Taubennessel*, *Todtennessel*, or *Bienensaug*). When fresh the blossoms have a sweet, pleasant smell, not unlike that of honey, and have a sweetish taste and are slimy. The infusion is largely used among the peasants and country people as a remedy for catarrh.

Recently FLORAIN (*Journ. de Méd. de Paris*, 3, vii., 1887) called attention to the fact that the blossoms of the *Laminum album* were a hæmostatic of the first order. The remedy is said to have been efficacious in cases of bronchial hemorrhage, blood coughing, and uterine hemorrhage where the usual remedies, such as ergotin, acidum tannicum, and the like had been used without success. In metrorrhagia the syrupy extract of the blossoms is used.

The use of the tincture in the following formula is advised:

℞ Tinct. flor. lamii alb., 100 (about ℥iv);
Syrup. sacchari, 50 (℥ii);
Aqua dest., 250 (℥ix).

A half-teaspoonful or a "coffeespoonful" of the mixture should be given every half-hour until the internal bleeding ceases, after which a tablespoonful should be given every four hours until all the symptoms have disappeared.

—*Pharmaceutische Zeitschrift für Russland*, September 22, 1887.

A CASE OF CIRRHOSIS HEPATIS HYPERTROPHICA CURED BY CALOMEL.

DR. SCHNEPP, of Vienna, in the *Wiener Med. Blatt.*, xiv., 1887, speaks of a case of cirrhosis hepatis hypertrophica cured by calomel. The patient was a woman aged 28, who had all the symptoms of cirrhosis hepatis well marked. The liver, upon percussion, was found to be greatly enlarged.

After a course of Karlsbad had been tried for five weeks in vain, and strong purges, followed by free operations, had afforded only slight relief, the author, prompted by the suggestion of Professor Nothnagel, ordered an absolute milk diet, and gave calomel in .05 ($\frac{8}{10}$ grain) doses three to five times daily. On the second day of this treatment the fæces had already assumed a yellow color and the urine had lost the most of its high coloring, and in a few weeks icterus and ascites had disappeared, the liver was much smaller, and menstruation had again set in. In three months the patient had taken one hundred doses of calomel, and complete recovery had resulted. Sensitiveness, enlargement of the liver, ascites, and "caput medusæ" no longer existed.—*Deutsche Medicinal-Zeitung*, September 22, 1887.

ANCHIETEA SALUTRIS.

Anchietea salutris St. Hil., belongs to the family of Violaceæ, and is found largely in Brazil and Guiana. The root of this climbing vine, which is called sipo or suma by the natives of Brazil, contains a but slightly known alkaloid called anchietine, to which emetic and anticatarrhal properties are accredited.—*Pharm. Zeitsch. für Russland*, September 22, 1887.

VATAIREA GUAJANENSIS.

The seeds of the *Vatairea guajanensis*, powdered and mixed with fat, are used as a salve in herpes serpigo and other skin-diseases. The brown-colored hulls, which contain the flat seed, are round, and of a leathery texture, with a hollow rim or edge, and do not burst open.

According to the *Pharm. Journal* the wood of the *Vatairea guajanensis* has an intensely bitter taste. The inner rind or bark is similarly used as the leaves. The drug is still being carefully studied and experimented with.—*Le Progrès*, Geneva, October 5, 1887.

PARTHENIUM HYSTEROPHORUM.

A new antifebrile remedy in England (*Pharm. Post*, 1887, No. xx., p. 442) is *Parthenium hysterophorum*, a plant which is indigenous to the West Indies and Louisiana. The active principle which it contains is a bitter alkaloid, which, when given internally, causes an increased secretion of the salivary glands, but has no effect on the secretion of urine.

According to Dr. Tovar, of Cuba, *Parthenium hysterophorum* is used there as a household remedy for malaria, and he recommends it himself as a good febrifuge. Mr. Egasse, *Arch. de Pharm.*, 1886, used parthenium as an antineuralgic and febrifuge in doses of 1 to 1.5 (15½ to 24 grains), and states that smaller doses do not seem to produce any effect whatever. The results of his experience with the drug are good.—*Pharm. Zeitschr. für Russland*, September, 1887.

EMBELIA RIBES, A NEW REMEDY FOR TAPEWORM.

Dr. Harris, of Simla, calls attention in the *Lancet* to the value of the fruit of the *Embelia ribes* for tapeworm. He states that the drug has for the last five years been used extensively not only by the natives, but also by the Europeans, with great success.

The dose of the pulverized fruit is from 1 to 4 drachms, which should be given in the morning with milk.

The fruit has an aromatic taste, and is about the size of a pepper-seed. According to Dr. Dymock, they have recently been exported in large quantities to Germany, where they are said to be used as the chief ingredient of several patent tapeworm "specifics." The drug is said to heighten the color of the urine.—*Le Progrès*, October 5, 1887.

ARADIRACHATA INDICA.

Aradirachata indica is a large-leafed zaradach, and an evergreen belonging to the family of Meliaceæ. It is indigenous to India and Syria, and is largely found growing wild in North America.

The bark is introduced into commerce under the name of *cortex margosæ*, or cortex aradirachata ("The Pride of India"). It is officinal in the United States, and is used as an anthelmintic.

The active principle is a bitter body which has not yet been closely studied, and to which Cornish has given the name of "*margosin.*"

According to *Il Farmacista Italiano et il Medico Practico*, the decoction of the bark (60 to 750) and the alcoholic tincture (1 to 5) are both highly recommendable.

The decoction should be given by the teaspoonful, in connection with a laxative, to rid the system of ascarides; the tincture should

be given in doses of 2 to 8 grammes (31 grains to 2 drachms), and is a good tonic.—*Pharm. Zeitschr. für Russland*, September 22, 1887.

SALOL AS AN ANTIRHEUMATIC.

Although for some time past the salol question has been almost exhaustively discussed in this and nearly all the leading medical and therapeutical journals, yet it still belongs to the newer remedies, and is still "on trial," and therefore any further light on its uses and value cannot fail but to interest the readers of the GAZETTE.

Recently BIELSCHOWSKI (*Therap. Monatshefte*, 1887, p. 47), of Breslau, has published an article on salol, which he calls by its euphoneous German name, "Salicylsaeurephenylaether," in which he says that for some time he has been using salol for acute muscular rheumatism, and that his opinions regarding the value of the drug in this disease are principally based on the result of a long series of experiments carried out in the Allerheiligen Hospital in Breslau. He considers it a specific; that it is equal in value to salicylic acid, and that it is superior to it on account of the fact that its use is unaccompanied by any unpleasant symptoms. Exanthema, perspiration, or digestive troubles were never observed, and only in one case a slight ringing in the ears was noticed. Bielschowski treated twenty-seven cases in all with salol; nineteen of these (among which fourteen were very severe) were promptly and completely cured by its use. In two cases the drug seemed to exert but little influence, whereas the use of 30 (nearly 1 oz.) of natr. salicylic. *per rectum* resulted in complete recovery. All the other cases, although both salol and salicylic acid were used, turned to chronic muscular rheumatism. Eight cases of relapse were observed, but they were all subsequently cured by salol given in small doses.

The drug was always given in capsules; usually 5 (77 grs.) were given *pro die*, inside of five hours; in a few cases 8 (123½ grs.) were given in eight hours. Smaller doses (2 to 3 = 31 grs. to 46½ grs.) were only used in after-treatment.

The smallest quantity of the drug which was sufficient to cause complete disappearance of the disease was 13 (about 3½ drs.), and the largest quantity that was ever given was 44 (about 1½ oz.).

After the use of the drug the urine assumes a brownish or dark-brown color (carbolurin), which, upon the addition of a few drops of liq. ferri sesqu., changes into a violet shade.

The experiences of DR. S. ROSENBERG, of Berlin (*Therap. Monatshefte*, 1887, p. 51), are not quite so favorable as those of Dr. Bielschowski. He also observed the prompt effect of daily doses of 6 to 8 (92½ grs. to 123½ grs.) when given in hourly or two-hourly doses of 1 (15½ grs.). Dr. Rosenberg, however, states that "nearly all" the cases suffered a relapse. Frequently, also, complications set in, such as pericarditis, endocarditis, and pleuritis. In one case the remedy completely failed to have any beneficial action, although its use (in 8 doses (123½ grs.) *pro die*) was continued for two weeks. This same case was then treated with natr. salicyl. (5 to 150), and a complete cure resulted in an incredibly short time. Also in regard to the accompanying symptoms, the experiences of Dr. Rosenberg are far from favorable. He states that he found the use of salol to be accompanied by all the unpleasant symptoms observed during the use of salicylic acid,—ringing of the ears, profuse perspiration, nausea, and vomiting, although the three last-named symptoms did not occur nearly so frequently as with salicylic acid. The ringing of the ears was often observed, and in some cases was quite severe. The smallest daily doses which caused disagreeable accompanying symptoms were 4 (62 grs.).

Dr. Rosenberg considers that salol simply acts as "disguised salicylic acid."

A beneficial action of salol was observed in acute cystitis and pyelitis by DR. L. FLEISCHENFELD, of Berlin (*Therap. Monatshefte*, 1887, p. 52), and also in prostatahypertrophy. In a few cases the use of the drug had to be discontinued on account of its causing increased pressure of urine. Otherwise Dr. Fleischenfeld observed no unpleasant symptoms accompanying its use.

THE VALUE OF HYDRASTIS CANADENSIS IN UTERINE HEMORRHAGES.

The value of the fluid extract of hydrastis canadensis in common menorrhagia is still a contested point among many able practitioners.

DR. J. M. FUCHS (in the *Wiener Medicinische Blätter*, No. 43, October 27, 1887) states that he has found it of great value in such cases, and also used it with success in a case of profuse menstruation which was undoubtedly caused

by a myoma of the uterus, which was as large as the head of a child. The case is one of special interest, as only very recently the use of hydrastis canadensis has been recommended in various affections of the uterus.

The patient was a woman, aged 35, who had been a mother four times, and always had an easy time, unaccompanied by any complications, and even since the birth of her last child (which was five years since) menstruation had always been normal and regular. For the last two years, however, menstruation had been irregular, and occurred every three weeks and lasted from ten to twelve days.

Fourteen months ago Dr. Fuchs saw the woman for the first time. She was greatly reduced, highly anæmic; was, however, wholly unconscious of the existence of the tumor, which was easily discovered, by palpation of the abdomen, to be situated on the front wall of the womb. With the exception of the continued hemorrhage, she said that she experienced no inconvenience from it whatever.

The vaginal portion of the uterus was normal. An examination with a sound was not permitted.

The author gave as a palliative ext. fluid. hydrastis cand. in doses of 20 drops four times daily. The first menstruation after its use was six days later than usual, and in three months the menstruation had become perfectly normal.

Dr. Fuchs now discontinued the continual use of the drug, and only gave it ten days before the usual period, and continued it until the menstruation had ceased. Up to the present time, which is over a year, the menstruation has continued to be regular.

Whether the tumor has decreased in size or not the author cannot say, as any thorough or intra-uterine examination is not allowed. At any rate, the symptomatic result is most favorable.

It should further be remarked that the drug was not only well endured by the stomach, but that it also had a beneficial effect on the digestion.

A NEW ANÆSTHETIC.

Dr. Njuschkon, in the *Casop. Cesk. Lékár.*, advocates the use of kandol in the place of ether or cocaine.

Kandol is a product formed by the distillation of naphtha, and is a perfectly clear, colorless fluid, extremely volatile, burns easily, and smells slightly of benzine. It can be mixed with a small quantity of water or alcohol. The preparation of the drug is simple, and it is very cheap. Its actions can be fully relied upon. It is used in the form of a spray as a local anæsthetic, and in one minute will reduce the temperature to —10° C., and the drug will keep it pretty uniformly at that temperature for some time, while ether reduces the temperature to —17° C.

The skin becomes very hard, and is completely anæsthetized, and there is either no bleeding at all, or else the blood coagulates as soon as it makes its appearance, so that all operations may be performed with great ease and rapidity.—*Le Progrès*, October 5, 1887.

THE VALUE OF SALOL IN THE TREATMENT OF ACUTE MUSCULAR RHEUMATISM, ETC.

A series of most interesting experiments has been recently carried out in the "Leyden" clinics regarding the use of salol in acute muscular rheumatism, lumbago, omalgia, etc. The drug was given in the form of powder, and in daily doses of 6 to 8 grammes (1½ to 2 drachms). The effect of the drug was truly wonderful, and could not be alone ascribed to the presence of salicylic acid in salol. In no case did the drug produce any disagreeable accompanying symptoms whatever.

Salol was also given in typhus, pneumonia, pyæmia, ulcerous endocarditis, and diphtheria, and proved itself to be a reliable antipyretic, although only of a medium and not of an excessive intensity.

Apyrexia was produced without any unpleasant symptoms, and the accompanying perspiration was moderate. Collapse was not observed in a single case. The diarrhœa was not in the least affected by the drug. The only disagreeable accompanying symptoms that were observed were occasional ringing of the ears and a few cases (especially in typhus) of gastric irritation, nausea, vomiting, etc. In one case only was the use of the drug followed by chills.

In one patient symptoms of carbolic-intoxication were observed in three days, twenty-four grammes (about six drachms) of salol having been administered.

In a case of myelitis, accompanied by paralysis of the bladder, the drug gave very good results, although the urine was in the act of decomposing.—Peiper, in the *Centralblatt für Klinische Medicin.*

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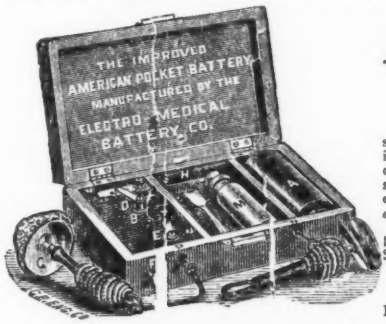

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The advantages of this preparation over others of a similar nature in the market are its greater purity, assimilability, medicinal efficacy, nutritiousness, and the additional fact that it is not a proprietary product. Its careful comparison by physicians with all other preparations of hypophosphites is solicited in the belief that such a test cannot fail to demonstrate its superiority.

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The results demonstrate conclusively the far greater diastatic value of Maltine, and enable me to state, without any qualification whatever, that it far exceeds in diastatic power any of the six preparations of Malt which I have examined.

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At the International Health Exhibition held in London, England, the only gold medal and the highest award of merit were given to Maltine by a jury composed of the best chemists in Europe; and recent analyses made by the most reliable authorities in Europe and America prove conclusively that Maltine—in nutritive and diastatic value—is superior to all other Malt preparations now in the market.

NOTE.—Physicians will observe that Maltine, as now prepared, is not so viscid as formerly made, being of a more fluid consistency; and, while retaining the nutritive and diastatic value which has given it precedence over all other Extracts of Malt, it is rendered entirely agreeable to the taste of the most fastidious, and is more easily administered. As now prepared we positively guarantee that Maltine will not ferment or congeal in any climate or at any season of the year.

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Physicians may obtain Maltine from all druggists in every part of the world. In cases where the physician intends to prescribe Maltine, the word "MALTINE" should be written, and not simply the words "Malt Extract" or "Extract of Malt."

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We will be happy to supply any regular practitioner with eight ounces each of any three Maltine Compounds that may be selected from our list, providing he will agree to pay the express charges on same.

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Plain Talks to Physicians.

Sugar and Gelatin Coated Pills and Pink Granules.

The advantages of pills as a method of exhibiting medicines need no presentation to a medical audience. Their supposed disadvantages, however, have restricted their employment by some physicians. To these latter the following facts may be of interest:

The appearance of a pill is very much dependent on the formula after which it is made, and the manufacturer is rarely responsible for a pill formula.

Staining of the coating which sometimes occurs is due to the absorption of the oil or other essential fluid constituents of the mass by the porous sugar, and is *prima facie* evidence that the medicinal ingredients are present. Staining, therefore, may furnish no proof of defective manufacture, but often the contrary.

Cracking of the coating is due either to the shrinkage of the pill mass through the evaporation of the moisture of the pill, or to expansion due to inherent peculiarities of certain ingredients of the mass. Thus, resinous substances, as copaiba, aloes, myrrh and the gum resins are peculiarly sensitive to the expanding and contracting action of heat and cold.

Owing to the action of high temperature, also, certain pill masses into which leptandrin, henbane, aloes, etc., enter largely, sometimes melt and swell, cracking the coating and exuding therefrom, gluing the pills together in one mass. This accident is not due to any lack of care on the part of the manufacturer.

Nothing has, however, more tended to bring pills into disfavor with some practitioners than evidence of their insolubility. A pill may be made insoluble by varnishing the mass before coating to prevent staining, which is done by some unscrupulous manufacturers. A properly made pill mass with coating of sugar or gelatin is always readily soluble in the digestive juices when these are normally secreted.

The pill mass may be insoluble either because it is inherently so, as, for example, pills of reduced iron, or because the ingredients are so compounded as to make an insoluble mass, or, again, on account of the drying of the pill to a degree of hardness which will resist the action of the digestive juices. When not inherently insoluble, insolubility of the mass is due, therefore, to lack of skill or care in manufacture, and to protect themselves and their patients from unskillfulness and carelessness, physicians should specify the product of a reliable house.

Most physicians who have used pills extensively have sometimes had their confidence in this method of medication shaken by the discovery that pills have occasionally passed through the intestinal canal intact. Such a fact is regarded by some as an unanswerable reflection on the manufacturer. Thoughtful physicians will, however, admit that sugar and gelatin, even though hardened, are quite as soluble, indeed more so, than many forms of food, and that a pill properly made in all respects may pass through the intestinal canal unacted upon on account of the condition of the patient. It is well known that in some forms of disease the secretion of the digestive juices is diminished or suppressed. If this fact be borne in mind and care be taken not to administer pills in such conditions, or only with food or some other excitant of the digestive and absorbent functions, there would be no such cases reported.

In concluding this talk, we may with propriety state that pills from our laboratory are made entirely by hand from the purest materials, and coated by a method avoiding the application of any degree of heat that could impair their medicinal efficacy. The formula in each instance is strictly followed and the ingredients perfectly distributed. Particular care is taken to insure the preservation of the drug, and for permanence, ready solubility, superiority of finish and uniformity of coating we believe our pills are unexcelled. We can, therefore, confidently recommend them to the profession. Our list comprises most of the official and popular formulæ known to the profession, and also many new and valuable combinations. We may mention also our line of sugar coated pink granules, designed for use in cases in which the dose is desired to be frequently repeated, or for administration to children.

We would request our medical friends desiring full information regarding this eligible class of medicinal products to send for our formula and dose list of pills and granules.

Very respectfully yours,

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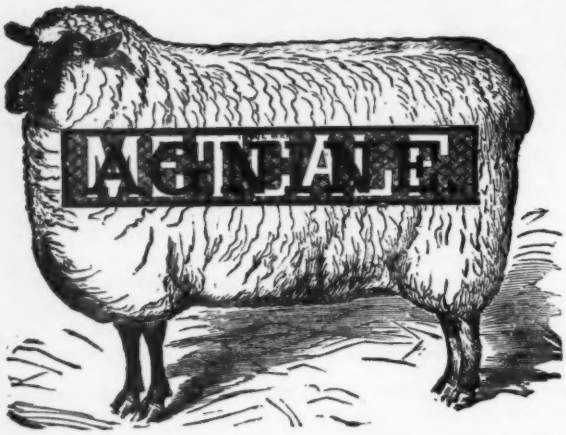

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DOSE OF THE POWDER.—FIVE TO TEN GRAINS IN TABLETS.

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Sample 100 5-grain tablets sent by mail upon receipt of $1.00.

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Eligible Methods——OF——ADMINISTERING QUININE.

Soluble Elastic Capsules.

We take pleasure in being able to offer the profession a device for the exhibition of quinine and cinchonidia, which presents many points of superiority over any which has been heretofore suggested. By means of our Soft Elastic Capsules the objectionable taste of the drug is, of course, completely concealed, while the ease with which this capsule is swallowed, after it has been lubricated with the saliva, makes it vastly superior to a pill or the hard capsule.

Cascara Cordial as a Vehicle.

This combination of aromatics and carminatives with Cascara Sagrada admirably disguises the bitterness of quinine. Its use for the purpose has led to its general employment as a vehicle, its fitness for which is the greater on account of its mild laxative properties, which correct the tendency to constipation induced by the prolonged administration of iron and opium preparations.

Aromatic Syrup of Yerba Santa.

The annoyance experienced in inducing children who will not swallow pills to take quinine in powder or in solution may be avoided by administering it in Aromatic Syrup of Yerba Santa. If the quinine is suspended in this syrup, and the mouth rinsed with a swallow or two of water, the objectionable bitter taste will no longer be experienced.

Fluid Extract of Licorice, for Quinine Mixtures.

Fluid Extract of Licorice, for quinine mixtures, is very generally used by physicians as a vehicle, but all may not be aware how effectually it disguises the bitterness of quinine. The desired dose of the quinine in powder should be added to a teaspoonful of the licorice and thoroughly mixed before being swallowed. We also prepare an **Aromatic Elixir of Licorice,** which should be used like the Fluid Extract.

We believe a trial of these convenient methods of exhibiting Quinine will convince physicians of their great convenience, and lead to their extensive use by the profession.

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PANCREATIN

PRODUCTS.

Pure Pancreatin.

Liquid Pancreatin.

Saccharated Pancreatin.

Peptonizing Tablets.

ALTHOUGH the active agents of the gastric and intestinal juices, and the rôle they play in the process of digestion, are now well known, the attempts to manufacture for medicinal use efficient preparations of these agents have been hitherto almost fruitless, the product being inert, pharmacally inelegant, and unsuitable for administration to patients whose digestive functions were already enfeebled and hypersensitive.

Recognizing the necessity of reliable preparations of the digestive ferments, we early made an exhaustive study of this subject, and we believe our Pepsin and Pancreatin products are well and favorably known to the profession.

Having greatly extended our facilities for the manufacture of pepsin on a large scale, we are enabled to devote especial attention to the production and maintenance of the best quality and uniform strength.

Pepsin has been offered of late years in a great variety of forms, and frequently with claims, as regards digestive activity, which actual experiment has failed to substantiate. The disappointment experienced by physicians who have prescribed this remedy has been frequently due to the worthlessness of the article dispensed. Certain brands of Pepsin which are most attractive in appearance, and whose ready solubility seems to be a strong point in their favor, consist chiefly of Peptones having very little digestive activity, and rapidly deteriorating with age.

The value of Pepsin depends wholly on its power to digest albuminoids, and our preparations are offered as wholly satisfactory in this respect. They combine the greatest possible freedom from impurities with unvarying strength and medicinal excellence.

☞ Circulars fully descriptive of our pepsin preparations mailed on request.

WE are now prepared to supply, in addition to our Pepsin products, a line of PANCREATIN PREPARATIONS, which on account of their purity, activity, and the convenient form in which we present them, will, we believe, be warmly welcomed by the profession. We offer the following preparations, viz., Pure Pancreatin, Liquid Pancreatin, Saccharated Pancreatin, and Peptonizing Tablets.

Especially convenient for use are the Peptonizing Tablets, which furnish a ready means of peptonizing milk, gruel, beef-tea, wine jelly, oysters, milk toast, and other foods suitable for predigestion and administration to those suffering from the various forms of indigestion, malnutrition, and mal-assimilation with emaciation.

In view of the especial care we have exercised in manufacturing these Pepsin and Pancreatin preparations (presenting them only after elaborate experiments made in the light of the most recent physiological investigations, and under the direction of eminent authorities), we have especial pleasure in commending them to the medical profession for trial, feeling confident that they perfectly meet the indications for an artificial aid to digestion presented by that very large class of cases which are conveniently grouped under the name Dyspepsia.

☞ We shall be pleased to furnish on application complete descriptive circulars, giving explicit directions for peptonizing various foods, and any desired information regarding this class of preparations.

PARKE, DAVIS & CO.,

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A VALUABLE PAPER,

READ AT THE NINTH INTERNATIONAL MEDICAL CONGRESS,

By Dr. A. L. A. TOBOLD,

Assist. Demonstrator of Pharmacy at the University of Pennsylvania,

ON

CARLSBAD WATER AND SPRUDEL SALT.

The famous fountain of health at Carlsbad, in Bohemia, which has been the refuge of invalids for five centuries, is certainly well worthy of a careful study. Although the subject is so old that it may be doubted whether there be anything new to say about it, nevertheless my experience with this remedial agent has been such that I may truly say that no remedy which I have ever employed has given me so much pleasure and profit as this particular one. Selecting a number of chronic hypochondriacs whose afflictions had baffled all my previous efforts as my subjects, I was truly astonished to note that, although no rigid diet was prescribed, and only a limited amount of exercise was indulged in, I obtained most remarkable results—the complexion even after a week's use began to clear up, the step became more firm and elastic, and, what was more, the entire host of hypochondriacal complaints seemed to vanish like mist. These surprising results bade me pause, and I then set about investigating the subject more closely—arguing that it certainly could not be the water alone that produced these effects. The diet and exercise having been left entirely out of consideration in several of the cases, I proceeded to use the Crystallized Sprudel Salz, which, being obtained by evaporating the waters, I thought must surely be the remedial agent. But, alas! when I came to use this, by dissolving it in ordinary water or in carbonic acid water, I invariably failed to get so prompt an action, and in the majority of cases utterly failed to get that peculiar therapeutic effect which I had obtained from the important mineral waters themselves. There was something at fault with either my argument or the Sprudel Salz. On looking up the subject I found that at Carlsbad the salt was only recommended and used as an addition to the mineral waters to act as a purgative when the waters failed in that respect. The analysis of the salt I found did not tally with that of the mineral waters, so for a time at least I fell back on the use of imported Carlsbad waters until my attention was called to experiments made by Dr. Jaworski, of Krakaw, with "Sprudel Salz Powder." I then determined to give this a trial. The chemical analysis of the Powder Sprudel Salz certainly more nearly corresponds to that of the mineral waters, and upon trial I found not alone that I could obtain the same effect with the Sprudel Salz Powder, but that in some cases it even acted better than the mineral waters themselves, it being possible to dissolve a proper dose in one glassful of water, so avoiding the distention caused in some patients by drinking four or even six glasses of mineral waters. The first case upon which I tried it was so unique that I was literally dumfounded at the result. A woman who five years before had weighed but seventy-five pounds had in that time increased in weight to 190 pounds—a gain of 115 pounds. She came to me for treatment, laboring under all the symptoms that would naturally be expected from such an enormous increase in weight I put her first upon the Crystallized Sprudel Salz, only to be disappointed; when, after several weeks, I used the Sprudel Salz Powder I was really startled to note the effect. In eight days—*i.e.*, from Wednesday to the next Thursday—she lost sixteen pounds, an average of two pounds per day, and was in consequence losing all the symptoms she had so much complained of. The woman had in the mean time been indulging in her customary diet, even to drinking several glasses of beer daily, and being a market woman she had been debarred from taking any extra exercise. This, then, verified my theory that if there was any therapeutic action in Carlsbad mineral waters it ought to have the same effect without the usual adjuncts of a Carlsbad cure, namely, diet and exercise. In the very next case, a mild one of diabetes mellitus, the sugar disappeared entirely after its use, the patient only abstaining from fresh fruits, and that because it caused too great a looseness of his passages. How the Sprudel Salz Powder acts in diabetes mellitus I am unable to say, and must content myself with stating facts only. I will not tire you with a recital of any more cases; I have arranged these in a tabular form attached to this paper. Sufficient, I think, has already been said to warrant calling your attention to a remedial agent that in one form at least has been known and used by the profession for the last four centuries.

As to the mode of administration: The dose of the imported mineral waters may be set down as 2-4 glasses of about 6 ounces each, drank slowly in the morning an hour before breakfast, another glass during the morning or afternoon, and one or two before retiring at night. The dose of the Sprudel Salz Powder is about one-half teaspoonful dissolved in a glassful of water or carbonic acid water, taken three times a day, either one hour before or two hours after meals. That of the Crystallized Sprudel Salz is from one to two teaspoonfuls dissolved in a glassful of water as a purgative.

It is generally recommended to continue the treatment for at least three or four weeks.

The water has a very pleasant taste, and is best taken cold, only when a less purgative action is desired, or in case of diarrhœa, it should be taken warm.

As to diet, experiments of Dr. E. Hlawacek and others, as well as my own, prove that any diet otherwise not contraindicated by the disease may be indulged in during the continuance of the treatment.

The effect of exercise, although not found essential, is a factor which I think ought not to be lost sight of, especially where the disease is caused by sedentary habits.

As to the difference between the Crystallized and Sprudel Salz Powder, I would say that both are obtained by evaporating the Carlsbad mineral waters; but the powder is, while still moist, exposed to the carbonic acid so abundantly given off by the springs, and in consequence differs from the crystallized in containing more carbonates and less sulphates. In fact, it contains all of the soluble constituents of the waters, and hence more nearly represents the Carlsbad mineral waters themselves.

In addition to this the Crystallized Sprudel Salz, being hygroscopic, frequently causes inconvenience on this account. The Sprudel Salz Powder, on the contrary, occurs in a fine granular powder, and is proof against all atmospheric changes.

In conclusion, I would say that the Carlsbad mineral waters as exported by the city of Carlsbad, being the natural product, is, of course, much to be preferred where the quantity of water is no objection, particularly in diseases of the stomach. Where, from any cause, two or three glasses of water (6 ounce each) cannot be taken, then the Sprudel Salz Powder answers the purpose equally well. The Sprudel Salz in crystals may be used in every case where a purgative action only is desired.

Furthermore, I would say that the Carlsbad mineral waters and Sprudel Salz do not differ in the least from any other remedial agent of well-known properties. That their effect is uniform and to be relied upon, independently of any adjuncts of treatment, such as diet, exercise, or water.

(Following this the doctor gives a table of 30 cases treated, of which 4 were hypochondriacs, 4 cases of chronic constipation, 2 with enlargement of the liver and constipation, 3 with jaundice, 1 adiposis, 1 diabetes, 2 with catarrhal inflammation of the stomach, 1 dropsy from valvular heart-disease, 1 gout, 1 dilatation of the stomach, 1 ulcer of the stomach, 2 children with marasmus, 1 enlarged spleen, 1 dyspepsia, 1 chronic pelvic cellulitis, rheumatism of the joints, gravel, etc.; of which 26 were entirely cured, 3 much improved, and 1 not treated long enough. Average time of treatment from 4 to 6 weeks.)

In none of the above cases was there any particular diet prescribed. The patients were allowed to choose for themselves and to eat whatever their appetites craved.

Only in one case (No. 7) a hypochondriac took riding lessons for one week, and then abandoned them entirely, until two weeks after the treatment, when, as he expressed it, he had more heart to go about among people and enjoy himself. The other cases took very little, if any, exercise outside of that required by their respective callings.

Many imitations of the genuine imported CARLSBAD WATER and SPRUDEL SALT being sold here, we state that the genuine has the signature of the representative for the United States, "Eisner & Mendelson Co., 6 Barclay Street, New York," on the neck of every bottle of the water, and on every cartoon of salt. The imitations consist of little else than Glauber Salt. Dr. Tobold's paper and table of cases mailed to any address upon application to the agents of the Carlsbad Spring, Eisner & Mendelson Co., 6 Barclay Street, by mentioning THE THERAPEUTIC GAZETTE.

EISNER & MENDELSON CO., 6 Barclay Street, New York.

IMPORTANT TO PHYSICIANS.

WM. R. WARNER & CO.'S

ELIXIR

SALICYLIC ACID COMP.

A Potent and Reliable Remedy in

RHEUMATISM, GOUT, LUMBAGO, AND KINDRED DISEASES.

This preparation combines in a pleasant and an agreeable form: Salicylic Acid, Cimicifugæ, Gelseminum, Sodii Bi-Carb., and Potass. Iodid., so combined as to be more prompt and effective in the treatment of this class of diseases than either of the ingredients when administered alone.

This remedy can be given without producing any of the unpleasant results which so often follow the giving of Salicylic Acid and Salicylate of Sodium, viz.: gastric and intestinal irritation, nausea, delirium, deafness, nervous irritability, restlessness, and rapid respiration; on the contrary, it gives prompt relief from pain and quiets the nerves without the aid of opiates.

Elixir Salicylic Comp. has been extensively used in private practice for several years with almost unvarying success and with better results than any other mode of treatment yet suggested.

It is a matter of great satisfaction to us to be able to place before the medical profession a remedy so effectual in the cure of one of our most stubborn classes of disease.

The dose is from a teaspoonful to a dessertspoonful, and increased as necessary to meet the requirements of the case.

Each teaspoonful contains five grains of Salicylic Acid.

Elixir Salicylic Comp. is put up in 12oz. square bottles, and is supplied upon Physicians' prescriptions by all leading Druggists.

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LACTOPEPTINE

THE MOST IMPORTANT REMEDIAL AGENT EVER PRESENTED TO THE PROFESSION FOR

Dyspepsia, Vomiting in Pregnancy, Cholera Infantum, Constipation, and all Diseases arising from Imperfect Nutrition.

LACTOPEPTINE precisely represents in composition the natural digestive juices of the stomach, pancreas, and salivary glands, and will, therefore, readily dissolve all foods necessary for the recuperation of the human organism.

LACTOPEPTINE

Is compounded with GENTIAN, IRON, STRYCHNIA, BISMUTH, QUINIA, CALISAYA CINCHONA, and PHOSPHATES, and various medications required in general practice, in the form of Elixirs, Syrups, Liquids, etc.

SPECIAL NOTICE TO THE MEDICAL PROFESSION:

Whenever satisfactory results are not obtained from the administration of **LACTOPEPTINE,** we will consider it a favor if such facts are reported to us, for there can be no doubt that substitution of Pepsin or some of the cheap imitations of Lactopeptine has been practised, whenever the therapeutic activity of Lactopeptine is not uniformly demonstrated in its indications.

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BEWARE OF IMITATIONS.

THE great popularity and large sales of Horsford's Acid Phosphate have caused many imitations to be put upon the market, with the apparent intention to deceive the dealer and public. Some of these imitations are put up in a similar style package, and bear names resembling the genuine, well calculated to deceive the careless purchaser. Even the color of the paper and the wording of the directions and descriptive matter are closely copied, and the compound is usually recommended as "The same as Horsford's," or "Just as good as Horsford's." We have analyzed all these imitations, and there is not one that is "the same as Horsford's," and some contain a form of acid that is poisonous.

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ORIGINAL LABEL:
"Colden's Liebig's Liquid Extract of Beef and Tonic Invigorator."

An Invaluable Aid in the Treatment of all Cases of Debility.

☞ ESTABLISHED 15 YEARS. ☞ ENDORSED BY SCORES OF PHYSICIANS. ☞ BEWARE OF IMITATIONS.

☞ ESSENTIALLY DIFFERENT FROM ALL OTHER BEEF TONICS.

COLDEN'S LIQUID BEEF TONIC consists of the Extract of Beef (by Baron Liebig's process), spirit rendered non-injurious to the most delicate stomach by extraction of Fusel Oil, soluble Citrate of Iron, Cinchona, Gentian, and simple aromatics. An official analysis of this preparation by the eminent chemist ARTHUR HILL HASSALL, M.D., F.R.S., and an endorsement by SIR ERASMUS WILSON, F.R.S., is printed on the label of each bottle.

In the treatment of all cases of Debility, Convalescence from severe illness, Anæmia, Malarial Fever, Chlorosis, Incipient Consumption, Lack of Nerve Tone, and of the Alcohol and Opium Habits, and all maladies requiring a Tonic Nutrient, it is superior to all other preparations.

It acts directly on the sentient gastric nerves, stimulating the follicles to secretion, and gives to weakened individuals that first prerequisite to improvement, an appetite.—☞ By the urgent request of several eminent members of the medical profession, I have added to each wineglassful of this preparation two grains of SOLUBLE CITRATE OF IRON, and which is designated on the label, WITH IRON, "No. 1;" while the same preparation, WITHOUT IRON, is designated on the label as "No. 2."

☞ *I will, upon application, send a sample bottle of* COLDEN'S LIQUID BEEF TONIC *to any physician in regular standing. Please ask your Dispensing Druggist (if he has not already a supply) to order it. In prescribing this preparation physicians should be particular to mention* "COLDEN'S," *viz.,* "EXT. CARNIS FL. COMP. (COLDEN)." *It is put up in pint bottles, and* CAN BE HAD OF WHOLESALE AND RETAIL DRUGGISTS GENERALLY THROUGHOUT THE UNITED STATES.

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BY FAR THE BEST TAR SOAP MADE. Has been on trial among physicians for very many years as a toilet soap and healing agent, and its superior virtues have been unanimously conceded in ALL CASES WHERE THE USE OF TAR IS INDICATED.

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Fl. Ext. Cascara Sagrada, dose, 5 drops to ½ drachm. Cascara Cordial (a palatable elixir Cas. Sag., very useful as a vehicle for nauseous or constipating medicines), dose, ½ to 2 drachms. Pil. Cas. Sag. Ext., 2 gr., dose, 2 to 3 pills, and Soft Elastic Capsules Cas. Sag. Ext. 2 and 3 gr., dose, 1 to 3 Capsules.

SOME ELIGIBLE COMBINATIONS OF CASCARA CORDIAL WITH OTHER REMEDIES.

(Reproduced from an article by R. S. Henry, A.M., M.D., published in the Phil. Med. and Surg. Reporter, October 23, 1886.)

℞ Tinct. ferri chlor., ℥vj to ℥xij.
Cascara cordial, ℥ij.
Water, q. s. ad. ℥iv.
M. Sig.—Teaspoonful, t. i. d.

℞ Potassii iodid., ℥ij.
Cascara cordial, ℥ij.
Water, q. s. ad. ℥iv.
M. Sig.—Teaspoonful largely diluted, t. i. d. The iodide of potassium to be increased as required.

℞ Dover's powder, gr. x.
Cascara cordial, ℥ij.
Water, ℥j.
M. Sig.—At a draught.

℞ Ferri hypophosphit., ℥ij.
Acid. hydrochloric. dil., q. s. ad. solv.
Cascara cordial, ℥iiss.
Water, q. s. ad. ℥iv.
M. Sig.—Teaspoonful 4 times a day.

℞ Quinine sulphat., gr. x.
Cascara cordial, ℥ij.
Water, ℥j.
M. Sig.—Take at a draught.

℞ Quinine sulphat.,
Caffeine,
Sodii salicylat., ää ℥i⅓.
Cascara cordial, ℥ii.
Water, q. s. ad. ℥iv.
M. Sig.—Dose, a teaspoonful on a little finely-cracked ice.

℞ Syrup. ferri iod.,
Cascara cordial, ää ℥ij.
Dose.—Twenty drops in water, t. i. d., increased as required.

℞ Sodii salicylat., ℥j.
Cascara cordial, ℥ij.
Water, q. s. ad. ℥iv.
M. Sig.—Teaspoonful in a wineglass of water 4 times daily, increasing or diminishing the salicylate as required.

℞ Tincture of opium, ℥iss to ijss.
Cascara cordial, ℥ij.
M. Sig.—Teaspoonful as indicated.

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NERVE-TONIC, STIMULANT AND ANTISPASMODIC.

FORMULA.—Every Fluid-Drachm represents FIVE grains EACH—Celery, Coca, Kola, Viburnum and Aromatics.

INDICATIONS.—Impotency, Spermatorrhea, Loss of Nerve-Power (so usual with Lawyers, Preachers, Writers and Business Men), Nervous Headache, Neuralgia, Paralysis, Dysmenorrhea, Hysteria, Opium-Habit, Inebriety, Prostatitis, Dyspepsia, and ALL LANGUID or DEBILITATED conditions of the System.—*Indispensable to restore a patient after alcoholic excess.*

DOSE.—One or two teaspoonfuls three or more times a day, as directed by the Physician.

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UTERINE TONIC AND RESTORATIVE.

PREPARED FROM THE ALETRIS FARINOSA OR TRUE UNICORN.

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Unrivaled as a Uterine Tonic in Irregular, Painful, Suppressed and Excessive Menstruation,

IT RESTORES NORMAL ACTION TO THE UTERUS, AND IMPARTS VIGOR TO THE ENTIRE UTERINE SYSTEM.

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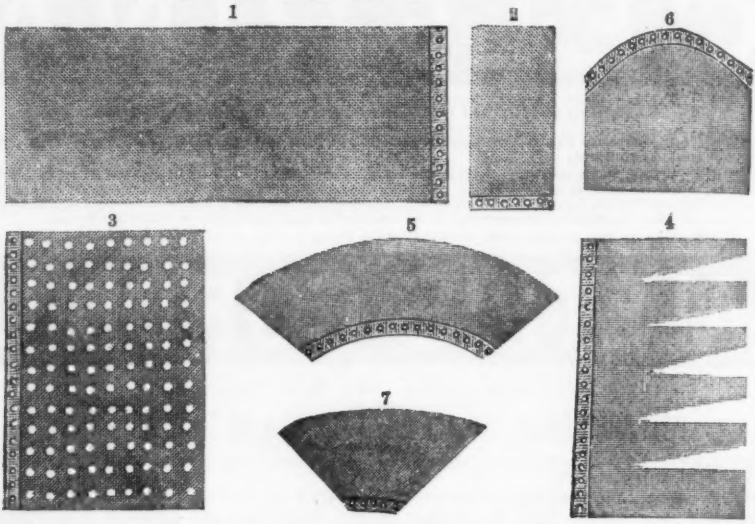

On each side of the wound or cut one of these pieces is firmly adjusted, and, instead of being closed by sewing through the flesh, the edges of the wound are drawn together by lacing like a shoe or corset. The thread can be carefully adjusted, and allows a painless bringing together of the severed parts with the utmost precision. It saves labor to the surgeon, causes no pain to the patient, and does away with the pain and irritation of the stitches during process of healing.

These sutures are made of plain or perforated material; but for general use the plain rubber adhesives are preferred. They are made of material tenacious enough to stand every strain to which sutures are subjected, and are supplied in straight or curved pieces, to adapt them to even very irregular-shaped wounds. They have been used and specially recommended for operations on children (harelip), on the breast, wounds in which inflammation has set in before treatment, cases where the operator does not wish to rely on sewed sutures alone, and where they are excellent to relieve strain in many cases of minor surgery; for the use on railroads, for lumbermen, sportsmen, etc., etc., they are of the greatest benefit.

Every box containing ten pairs of assorted sutures, needle, and lacing silk, in order to be ready for instant use.

Price per box, $1.50, or in one-yard lengths, $1.00 each. For the use of hospitals, etc., the Farny Suture is also supplied in lengths of one yard by six inches, at $1.00 per yard.

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BY MEANS OF

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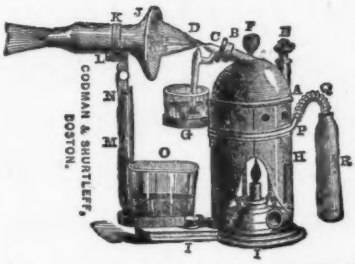

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The Essential Elements to the Animal Organization,—Potash and Lime;

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The Vitalizing Constituent,—Phosphorus,

Combined in the form of a Syrup, with *slight alkaline reaction.*

It Differs in Effect from all Others, being pleasant to taste, acceptable to the stomach, and harmless under prolonged use.

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Its Curative Properties are largely attributable to Stimulant, Tonic, and Nutritive qualities, whereby the various organic functions are recruited.

In Cases where innervating constitutional treatment is applied, and tonic treatment is desirable, this preparation will be found to act with safety and satisfaction.

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The Prescribed Dose produces a feeling of buoyancy, removing depression or melancholy, and hence is of great value in the treatment of MENTAL AND NERVOUS AFFECTIONS.

From its exerting a double tonic effect and influencing a healthy flow of the secretions, its use is indicated in a wide range of diseases.

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The Fibrin Digesting Principle of the Pancreatic Juice.

Especially Prepared as a Solvent for Diphtheritic Membrane.

Trypsin has the property of digesting fibrin with great rapidity.

It acts (like all the pancreatic ferments) independently of any special condition of acidity or alkalinity of media. But it is most effective in a slightly alkaline solution.

It is an entirely innocent and non-irritant substance, and does not attack the healthy tissue or non-fibrinous tissue.

In its application to the throat all the conditions are favorable to its physiological action.

Trypsin will be found to be a powerful solvent of diphtheritic membrane in all cases in which it is practicable to bring it in contact with the membrane.

THIS MIXTURE MUST BE PREPARED FRESH WHEN OCCASION ARISES FOR ITS USE.

Trypsin (Fairchild)	gr. XXX.
Sodii bicarbonatis	gr. X.
Aquæ Destillatæ	℥j

Make a very smooth mixture, rubbing the Trypsin down with the water added little by little.

Apply with a brush or by spraying. The application should be made as frequently as practicable—several times within an hour if necessary.

WITH A BRUSH.

Pour out in a little glass or saucer sufficient for an application, so as to avoid returning the brush into the solution after using it.

WITH THE SPRAY.

Fit the atomizing instrument to a small narrow vial, or to a test tube, pour a drachm or two of the Trypsin mixture into the atomizer. Now have a glass of water as hot as can be agreeably borne by the mouth, and immerse the containing tube or vial of the atomizer into this for two or three minutes until the Trypsin solution is *warm*, then apply the spray. The spray may be effectively employed without warming; but when at a temperature somewhat higher than that of the body—say 110 F. or so—it acts more rapidly. The entire quantity of Trypsin solution may be at once poured into the atomizer, and so sprayed from as desired. But by attaching a suitable tube or vial to the atomizer **small quantities** may be sprayed warm, and the bulk of the solvent kept in a well-stopped vial.

It may also be applied by putting a few grains of the Trypsin (three or four) with a grain or two of soda upon a saucer, and by means of the brush with which it is to be applied, mix with a little water to suitable consistency.

These suggestions are offered in order to facilitate the practical use of the Trypsin. The practitioner will find upon experience the best details and methods as to its employment.

We have received many reports of the successful use of Trypsin in membranous croup and in diphtheria. This agent certainly deserves a wide trial upon the ground of its intrinsic merit as a known solvent of fibrinous membrane superior in activity to any other digestive principle, or to irritant chemical solvents.

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